How do teachers deal with uncertainty in relation to working with children with autism in the context of the introduction of a new technology tool?”

JOSEPH MINTZ

A thesis submitted in partial fulfilment of the requirements of the University of East London for the degree of Doctor of Philosophy

Submitted May 2012

Abstract

This study is an exploration of how teachers deal with uncertainty in the classroom. The particular context of the European Commission funded HANDS project, which developed a mobile technology tool to help children with autism to develop social and life skills. The first prototype of the HANDS tool, running on smartphones, was tested at four special schools across Europe in the 2009/10 academic year. The context of teachers working with children with autism combined with the introduction of a technology innovation is viewed as a fertile crucible for exploring teacher uncertainty.

The concept of uncertainty is developed via an integration of Donald Schön's idea of reflection in action and Wilfred Bion's epistemology. In tandem, a psycho-social interpretivist approach to understanding the teachers' work in the classroom, based on infant observation, is developed and applied to a detailed consideration of the work of five teachers at the UK school using HANDS.

Several areas of potential uncertainty are identified, including uncertainty relating to areas of practice including diagnosis, the relationship between expert knowledge and practice, the implications of autism for autonomy and agency, and uncertainties in relation to the understanding of and use of new technologies per se.

Conclusions are drawn about teacher identifications to new technology, the potentially productive role of uncertainty in the intersubjective relationship between teacher and child, and the relevance of a psycho-social approach to considering professional thinking.

Declaration

This thesis represents my own research and original work. It cannot be attributed to any other person or persons.

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Acknowledgements

I would like to acknowledge the support given to me by my supervisors–Dr Heather Price, Professor Andrew Cooper and Marie Joseph. I would also like to thank my wife for always being there for me.

Dedication

I would like to dedicate this thesis to the memory of my dear late mother, Jennifer Mintz (may her memory be a blessing), who would have been so pleased.

1. Introduction

1.1 Teacher Uncertainty and Autism

Teaching is a difficult job. In no other profession does one need, for up to six hours a day, day in and day out, to interact with and meet the varied learning, social and emotional needs of groups of young people who daily are changing, developing, and negotiating their identities and the boundaries between themselves and the world. I know from my personal experience working as a mainstream primary school teacher that the complexity of the task can often mean that teachers are unsettled, anxious and uncertain about what is the "right" thing to do in any given teaching moment. When the young people concerned also have difficulties with learning, often with diagnostic labels attached to those difficulties, then this can add an additional layer of complexity and uncertainty to the experience of being a teacher in the classroom. This study is an exploration of how teachers deal with and respond to this uncertainty. Such an exploration raises questions including:

1. In dealing with uncertainty what recourse do teachers make to expert knowledge such as cognitive accounts of particular diagnostic categories?
2. How is this balanced with their on-going experiential or tacit knowledge gained from working with other similar children or from working with the same child over time?

The study focuses on one particular diagnostic category of Special Educational Needs (SEN) – namely Autism or more commonly Autism Spectrum Disorders (ASD). Autism raises significant questions in the minds of caring professionals, particularly around issues of agency, autonomy and independence because its impairments strike at the heart of what we often take to be a given in human experience, namely the ability to engage in social communication. My contention is that teachers working with children with autism are likely to experience lots of uncertainty.

The study also focuses on the work of a group of teachers at one special school in the United Kingdom (UK) working with children with autism in a particular context, namely the introduction of a new technology tool. The tool in question is a mobile application; created as part of the European Commission (EC) funded “HANDS” project (see Section 1.3 below), and designed to help children with autism to develop social and life skills.

As I will explore, when technological innovations are introduced into the classroom, as with any change, this tends to provoke for teachers anxiety and uncertainty about both the significance of the new technology and how it might be used in relation to their current practice. Mobile technology in particular also raises particular issues for teachers, due to its associations with emerging new teenage modes of communication and interaction. These raise, for teachers, questions of both modern adolescent identity and how schools and teachers relate to the development of that identity. These questions are even more acute when applied to teenagers with problems with social communication, namely young people with autism. Autism and new technology, therefore, can be thought of representing a productive crucible for the exploration of teacher uncertainty.

The particular lens that I employ to think about this idea of uncertainty is mainly, although not exclusively, a psychoanalytic one. I make particular use of Wilfred Bion’s epistemology, a system of thinking about how we think and come to know about the world. Bion’s epistemology, in fact, foregrounds uncertainty, with knowledge, particularly about the human other, arising from the toleration of a state of uncertain “not knowing”.

1.2 The Context for the PhD

When I registered for the doctoral programme in 2007, I was interested, based on my experiences as a mainstream classroom teacher, in exploring how teachers dealt with uncertainty when working with children with special needs

generally. I did, however, have an on-going interest in autism specifically, which grew out of the focus of my Tavistock D1[1] Masters course on my experiences of working with one boy with autism as a class teacher. In 2008, the opportunity arose to become involved in the HANDS project based on my attendance at autism-related conferences, which led to a collaboration with the project coordinators, Aalborg University in Denmark. I was also interested in the project because of my background working with technology, initially in the computing industry before I went into teaching, and subsequently in my role as Information Communications Technology (ICT) Coordinator at several primary schools.

This potential involvement in HANDS was not foreseen at initial enrolment and registration but it provided an opportunity to further develop my interests in both autism and technology, whilst still keeping the original focus of the PhD study on teachers' professional practice and on the place of uncertainty in that practice, when working with children with SEN. More importantly and independently both autism and technology had the potential to stimulate uncertainty for teachers in the classroom. The combination of both these factors was therefore rightly viewed as an appropriate context for the exploration of teacher uncertainty.

1.3 The HANDS Project

The HANDS project evaluated the use of a smart-phone application, which allows teachers to flexibly develop interventions on smart-phone devices which support children with ASD with social skills and life skills functioning. The software was developed using the principles of Persuasive Technology as the basis for the design process. Persuasive Technology is an emergent sub-discipline within the field of Human Computer Action, which was originally formulated by Fogg (2003). Drawing on elements of social psychology, persuasion research and communication theory, persuasive technology

[1] D1 Masters in Counselling Factors in Learning and Teaching

considers how computers can be used in a broadly consensual manner to persuade people to adopt particular attitudes of behaviours.[2]

Implementation of an initial prototype took place at four special schools for children with ASD (in the age range 11-16) located in Denmark, Sweden, Hungary and the UK in 2009-2010. The software consists of a web-based flexible toolkit that teachers use to develop specific support and intervention sequences specific to the need of each child. These sequences consist of a series of linked screens, each of which can include customizable text, images, video and sound. These customized "personal trainer" (PT) sequences can be linked to the associated comprehensive diary function also included in the software. Personal trainer sequences can be stored as templates, and a sharing function allows teachers to adapt existing sequences for other children. The software also includes a function-rich diary system that allows for the creation of appointments, reminders and prompts, that can be directly linked to personal trainer functions. Intervention sequences developed using the flexible toolkit are then loaded via a synchronization function onto the client application on the child's smartphone. The system also includes an electronic footprint feature that creates a log file record for every use of the mobile application by the child. Test implementation and quantitative and qualitative evaluation of the first prototype was undertaken between 2009 and 2011 at four test site schools involving 15 teachers and 47 children. The demarcation of the PhD as part of the qualitative strand is detailed in section 1.8 below.

The focus of the HANDS software was on developing social and life skill functions. In social skills, these included prompts to support children in remembering to consider other people's perspectives and short personal trainer sequences to help children calm down in situations likely to lead to emotional

[2] It is not my intention in the thesis to give any detailed treatment of Persuasive Technology, although I have elsewhere developed a consideration of the potential and implications of its use in educational settings (see Mintz, J., & Aagard, M. (2012). The Application of Persuasive Technology to Educational Settings. *Educational Technology Research and Development*, *Online First*, 1-17.).

outbursts. Teachers also used the personal trainer function to adapt "social stories" (Gray 2007) presenting a narrative about a situation, skill, or concept in terms of relevant social cues, perspectives, and common responses, to an electronic platform. Life skills interventions developed in HANDS included managing money, dealing more effectively with time management, managing public transport and aiding self-monitoring of the administration of medication. Problems with life and social skills functioning are a central concern for teachers and other professionals working with children with ASD. They are linked particularly to issues of agency and autonomy. As such, introducing a technology innovation related to these domains is likely to have stimulated teacher reflection and uncertainty around questions such as: What can these young people do by themselves? Will they ever be able to engage in independent social communication that will allow them to live independently? Will they be more capable of organisation and planning than they are now? Does their ASD diagnosis mean that they will be unable to engage in independent adult life or are they all individuals with different strengths?

1.4 How HANDS works

Figure 1, 2 and 3 show a sequence of screens from the HANDS application, illustrating how the software works on the child's mobile device. These screens were developed for one of the children at the UK School, "Randall" School[3], a boy of 17 with an autism diagnosis, placed in the school's Further Education department. The key issue that his teacher focused on with him with HANDS was his problems with organisation, and she developed a Personal Trainer to help him with accessing public transport independently, and one to help him with the steps involved in making toast in the school kitchen (and at home). His school diary was also implemented on the HANDS diary function.

[3] The name of the school and names of all the teachers and children referred to in the thesis are pseudonyms.

Personal Trainer sequences can be linked to diary appointments, as with the sequence for making toast, which as
Figure 2 shows, is linked to an appointment scheduled for a lesson on daily living skills. Reward points are generated when particular HANDS functions such as a Personal Trainer sequence are completed, with their allocation determined by the teacher.

Figure 4 shows the teacher set-up server application, which runs as a web based application accessible from any computer with a web connection. The first screen shown is the landing screen for set-up application. Also shown is the set-up procedure for a Personal Trainer, as well as two screens for setting up the child's Diary function timetable.

As indicated, in this study I will explore, amongst my sample, what teachers working with children with autism in one school do or do not know about both the cognitive science of autism and autism pedagogy, and the balance in their thinking between tacit and expert knowledge, as well as considering how this relates to their "in the moment" practice in the classroom with these children.

Figure 1 Personal Trainer Application for getting the bus

Figure 2 Diary Function Day Page and linked Personal Trainer Application for making toast (extract of full sequence)

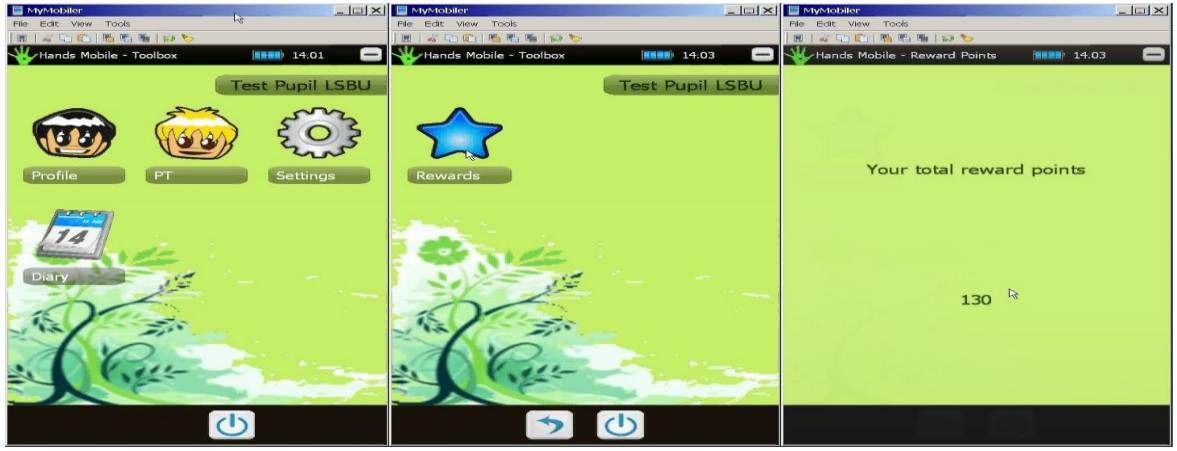


Figure 3 HANDS Application Landing Page and Rewards Screens

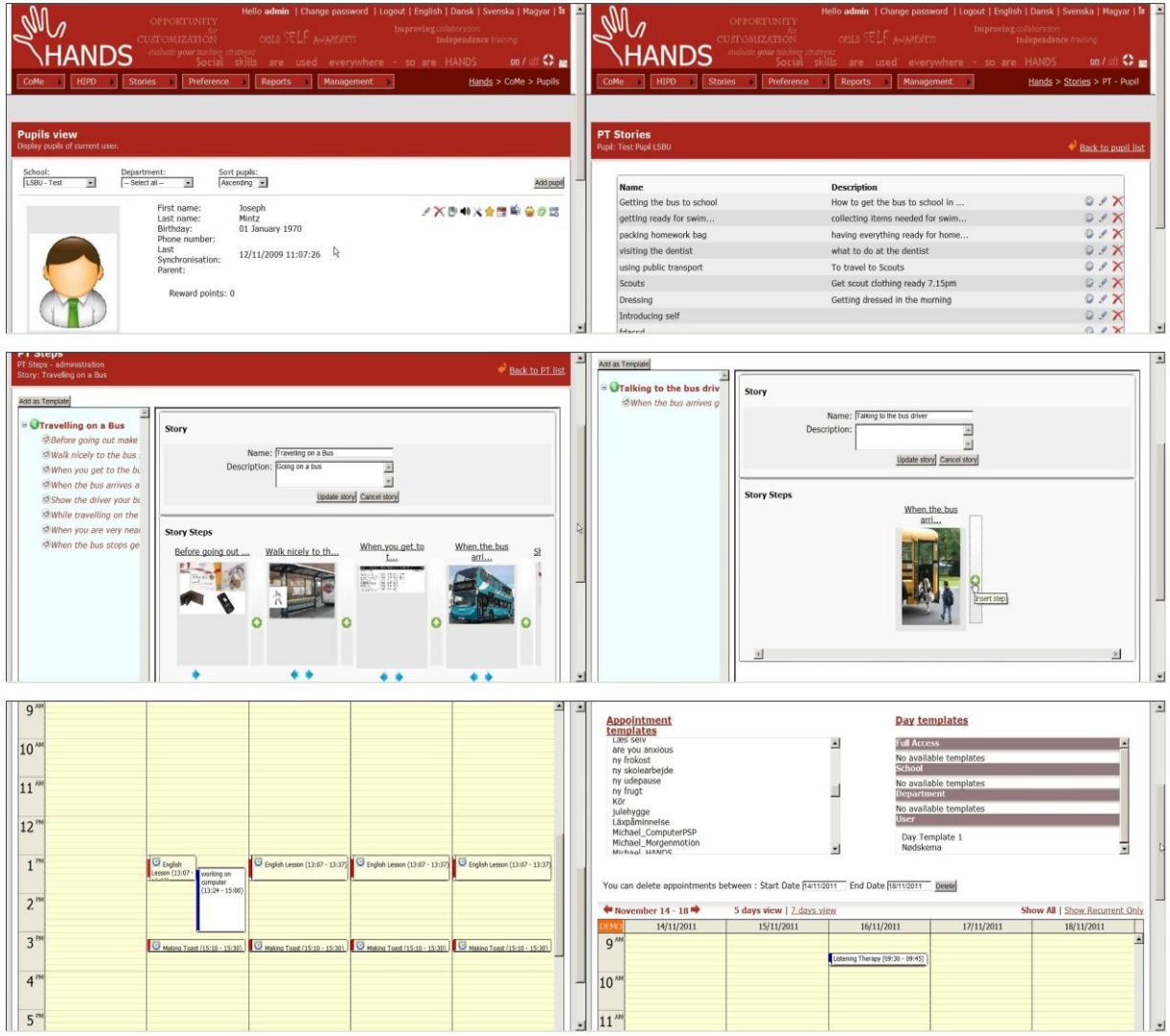


Figure 4 Teacher Set Up Application

1.5 Technical Problems

The implementation of the HANDS prototype from October 2009 involved a number of significant technical problems. Out of the four schools using HANDS, these problems were most significant at Randall School. The largest problem was that involving synchronization. Once the teacher has set up interventions such as Personal Trainer sequences or diary entries for the child on the web based set-up application, these then need to be downloaded over the web to the child's HANDS application on the mobile device. This is known as synchronization and requires a web data connection on the mobile device. There were significant problems at Randall School with achieving a stable data connection, partly due to problems with the service provided by the airtime contract provider. The procedure for synchronization in the first prototype was also somewhat clumsy and difficult to use. The combination of these problems made the process of synchronization highly problematic, particularly for those teachers without advanced technical skills.

Again, partly due to problems with the airtime provider, for a period towards the end of the autumn term 2009 it was not possible to securely prevent children from going over their data download limit on the HANDS mobile. This meant that they could potentially incur high data charges if they went onto applications such as YouTube. This problem was rectified by switching off the data connection at the start of the spring term 2010. This meant, however, that the HANDS phones were removed from the children for a couple of weeks at the start of January 2010, and that from then on they could not access the Internet or applications like YouTube. The gap in availability of the phones, but more significantly the removal of internet access, had a negative effect on the perception of some of the children about HANDS.

There was also design and usability issues with the first prototype of HANDS which was implemented in the 2009/10 year. For example, some phones had problems with the HANDS application freezing on occasion and needing to be

reset, and some functions, particularly on the teacher set-up application were perceived as clumsy and/or difficult to use.

1.6 Randall School

Randall School is a school for children with autism from the ages of 5 to 18. It is located in a rural part of England, and has around 80 children and 10 teachers, as well as a large number of support workers who act in what is essentially a teacher assistant role. There is also an Educational Psychology and Speech and Language Department on site at the school.

It is a successful and well-regarded school, which gained an Outstanding Grade on its last Ofsted inspection. The children attend the school from a radius of around 30 miles, and many children are brought to school via a taxi service.

All children admitted to the school need to have a psychiatric diagnosis that places them on the autism spectrum. Most of the children are higher functioning, with most children having an IQ on WISC-IV of over 70.
Randall School is part of Non-Governmental Organisation providing autism services across the UK. Its technical support is provided by the NGO's central ICT service and, as such, teachers in the school have limited control over the installation and modification of software and hardware. Difficulties in communication with the central ICT service contributed towards the technical problems experienced with HANDS, in that it was often difficult to get the required support which would have allowed for a more rapid resolution of some of the problems that arose.

1.7 General Approach to Working with the Teachers

Within the HANDS project we adopted a general orientation in which teachers were considered, a priori, to be competent professionals with significant knowledge about how to work with children with autism in the classroom

(whether this was theoretical or practice-based was not specified). As such, researchers at Aalborg and London South Bank University (LSBU) both undertook interviews with teachers in 2008/2009 about what they felt should be included in the software and this fed into the development of the software specification.

When the first version of the developed software was released in September 2009, training courses in the use of the software, as well as a user manual, were developed and on-site face-to-face training was delivered in October 2009 to all the teachers expected to use HANDS at the schools. At Randall School, this training was mainly delivered by colleague researchers, and amounted to two half-day training sessions for each teacher.

1.8 The Demarcation of the PhD Sub-Project

The overall HANDS project encompassed an evaluation of the implementation of the HANDS smartphone and software, including an evaluation of the impact on teachers, teaching assistants, children, parents and other professionals working in the 4 project schools.

It covers all four special school test sites for HANDS and included a multiple mixed method approach as follows:

1. *Cognitive psychology testing,* involved a quasi-randomized crossover controlled trial making use of standardized instruments (such as the Social Responsiveness Scale) to measure the effect of the introduction of an ICT tool based on persuasive technology in developing the children's social skills, self-management skills and social integration The effect and efficiency of the HANDS toolset was measured as the progress relative to an individual baseline established before the tests.
2. *Applicability to the Learning Environment,* involved a qualitative evaluation of how the use of the HANDS toolset was integrated into the

learning environment, and qualitative evaluation of the effect of the ICT tool in developing social skills.

It is important to note that my role in the overall HANDS project was to lead on the second qualitative evaluation, as well as to take the lead on the implementation of the software at the four test site schools.

However, the PhD Study is clearly demarcated as focusing specifically on the teachers at Randall school, the school in the UK, and on their professional thinking. Five teachers at the school were included in the study. Although other researchers were involved in the overall HANDS project, all observations and interviews used in the PhD Study were undertaken by me. Whilst the data so collected was of use in the overall HANDS project, activities, data collection and data analysis relating to the PhD Study were clearly demarcated within the overall HANDS project.

As indicated in this example, specific interventions on HANDS were individualized to social and life skills situations appropriate to the needs of each child. In considering the customization for each child, the teachers were closely involved in working with the children to select particular social and life skills situations and considering the customization of the technology tool in relation to those situations.

1.9 About Uncertainty

My interest in uncertainty arises from my reflection on my experience of “not knowing” when working as a class teacher with children with special needs, including those with autism. This uncertainty is the anxiety and confusion linked to classroom situations in which one experiences a state of “not knowing” in relation to which knowledge to make use of when deciding what to do in working with children with autism. For example, it might be considered that teachers may be uncertain as to whether to draw on explicit psychological theories about autism, past experiences of working with similar children, advice

from specialist colleagues such as educational psychologists, or their ongoing tacit experience of working with that particular child. A particular question, both for teachers themselves and for those observing and thinking about their practice is perhaps, 'What is the balance between the uses of explicit versus tacit knowledge?' As such, my framing of uncertainty inevitably calls to mind the work of Donald Schön (1983). Schön emphasized the importance for professionals of tacit as well as explicit knowledge. His concept of "reflection in action" is based on the premise that all professionals make use of a combination of both types when working "in the moment" on solving professional problems. However, as I will explore, Schön's consideration of what goes on "in the moment" is under theorized, particularly for professionals working in the caring services. My contention is that applying a psychoanalytic lens, particularly one based on Bion's epistemology of how knowledge arises in the intersubjective relationship between two people, can serve to illuminate what goes on in that "uncertain moment" when teachers come to decisions about how to work with children with autism. In particular, a Bionic lens suggests that there is something inherently uncertain in "the moment" when caring professionals relate intersubjectively to their clients, and that this uncertainty is a crucial part of, or even defines, the process of coming to know, in a truly useful sense, about the client.

This bringing together of Schön and Bion in the context of considering teacher uncertainty is, I believe, something new, and as such represents an original contribution.

1.10 Sources of Uncertainty for Teachers working with Children with Autism

1.10.1 The Social and Medical Models of Special Educational Needs

One source of uncertainty, which applies generally to teachers working with children with special needs, is the tension between the social and medical

models of disability, expressed in ongoing political and policy debates about inclusion. Put briefly, there has been a continuing shift towards a social model (Oliver 1990) whereby any difficulties experienced are viewed as arising from a mismatch between the specific needs of the child and the provision made by the educational system. The "progression" to inclusion is seen as moving away from locating problems with learning within the child, placing greater emphasis on the role of the environment in creating difficulties with learning – a "social" model of disability. Thus an inclusion model sees difficulties in learning as being socially produced, as being an effect of the social environment. It is inclusive because in this model all children's needs are produced in this way, and all children are viewed as having equal rights to an education which meets their needs. The prevalence of an inclusion model as a way of thinking in relation to disability across the developed world can be illustrated by any number of references in the contemporary literature on education practice. A few examples are Knight (1999) who discusses practical issues involved with implementing inclusion policies in mainstream schools, Forbes (2007) who discusses the development of inclusion as an overall approach in Australia, and Jones (2005) who considers children's interpretations of inclusion and special educational needs in the American context.

1.10.2 Sociological and Psychological Positions

It is possible to identify an ontological split in the positions adopted by theorists about how to conceptualize SEN, which mirrors the split between the medical and social models of disability. On the one hand we have clinical and cognitive psychology and psychiatry, intimately involved with the "diagnosis" and "treatment" of conditions given diagnostic labels. This might be termed the psychological position, with theorists/clinicians such as Detterman and Thompson (1997) adopting, as we have discussed, an essentialist view of SEN as something with a fixed, unchanging quality located within the child. The alternative, prevalent more commonly within the academy, might be termed a sociological position. The educators and academics adopting this position maintain that SEN cannot be regarded as a fixed quality of individual children,

but rather see the special needs of individual children arising mainly as a result of the response of the social and educational environment to an impairment, whose expression can vary and develop depending on the effectiveness of that response.

National and local policies in schools, on curriculum, assessment, the application of diagnostic labels and so on have been influenced over the last thirty years by people whose views come from one or other of these positions. It seems reasonable to suggest, therefore, that these heavily conflicting signals may engender significant uncertainty in the teachers who actually have to work with the children concerned.

1.10.3 Uncertainty about Autism

This is a (modified) extract from the HANDS Project Proposal:

> 'Autism is typically regarded as a developmental disorder of the human nervous system which is characterized by mild to severe impairments in(1) reciprocal social engagement, (2) reciprocal communication, and (3) flexible regulation of self, behaviour and interest (See the 'autism triad' – e.g. Bailey et al. 1996). These are especially striking features of autism, as affected individuals often have non-impaired general intellectual capacities (so-called "high-functioning" individuals with autism). Impairments in social and communicative reciprocity and in adaptive, flexible regulation of self and behaviours in individuals with autism lead to significant difficulties in both social and life skills (Howlin 2005).'

This definition was largely developed by my esteemed colleague Miklos Györi on the HANDS Project, at Eötvös Loránd University (ELTE). It is typical of psychological definitions of autism and is clearly located firmly within the medical model. Such conceptualizations of autism have been subject, unsurprisingly, to sociological critiques. For example, Molly and Vasil (2002), writing specifically about Asperger's Syndrome, explicitly challenged the use of

Asperger's Syndrome as a diagnostic term in educational and other settings, accusing psychologists and other professionals who have developed its use of unnecessarily pathologizing a group of children. Bogdashina (2006) has, to the considerable annoyance of the targets of her criticism, also applied what is effectively a sociological critique to the way in which clinical professionals, in her opinion, use and abuse the label ASD.

At the same time, more essentialist accounts of autism contend that the biological, genetic and clinic evidence is clear in pointing towards the psychological definition of ASD as being the key starting point for thinking about this condition. Such accounts have significant force in schools as they tend to be the ones which are directly operationalized by the educational and clinical psychologists with whom teachers of children with autism often closely work alongside.

For teachers working with children with autism, the competing psychological and sociological positions raise in particular the issue of capability, leading to on-going questions such as: Is their social impairment so significant that it is not possible to change the classroom or society to meet their needs? Do they need "different" (and separate) educational provision? Should we let them stay in their "shells" or encourage them to come out in to the social world? Is such social development possible or desirable? Can children with autism function effectively in the social, educational and economic world, or should we be happy to consign them to a different level of existence which suits them?

This discussion serves to illustrate that the conceptual tensions and uncertainties that teachers experience when working with children with SEN in general, can be even more acute for teachers working with children with ASD.

Teacher uncertainty which relates to ASD can be considered to include:

- On-going uncertainty, even for children in autistic special school settings, of clinical diagnosis – for example, the assignment of competing

diagnostic labels such as Asperger's Syndrome vs. High Functioning Autism in relation to specific children.

- Uncertainty about the implication for practice of specific diagnostic labels within the spectrum or of the autistic spectrum in general. ASD is a syndrome and as such, it has a very broad range of expression. In a sense, then, the use of the term ASD can be even more of an abstraction than for other conditions. This can make it more difficult for teachers to balance the significance of an autism diagnosis with the specific knowledge of and relationship with the individual child that they know. The tension between these two aspects is a potential source of considerable uncertainty for teachers working with children with autism.
- Uncertainty by teachers about their level of knowledge and understanding about the autism spectrum, and uncertainty as to the significance of this in relation to their effectiveness as teachers.
- Uncertainty about the implications of an autism diagnosis for the child's ability to act autonomously and independently in the world

1.10.4 Uncertainty about Agency and Autonomy in Autism

As the autism definition from the HANDS project proposal indicates, there is a clear link between impairments in social communication and reciprocal communication and the ability to function independently in the wider world. The whole premise of the HANDS project is that mobile technology interventions designed to support the development of social and life skills might be able to contribute to improving the extent to which children with autism can engage with social, educational and employment opportunities. Howlin (ibid) has shown in detail the devastating effect on ongoing life trajectories and life chances that autism and ASD can have. Teachers working with children with autism, particularly in special school settings, are likely to be thinking about the question of what will happen next to these teenage children when they leave school. Implicitly, this means they are also thinking about questions of agency and autonomy. What can this child do or not do? What does their autism diagnosis mean for what they will be able to do in the future? Are they able and will they

be able to take decisions for themselves, to express themselves as rational choosing agents, or will they forever be in a dependent role where decisions are made for them? Is it even in their interests for teachers and carers to promote their independence and autonomy?

There is a partial mapping between questions of autonomy and independence and the psychological and social positions on autism, although it is far from straightforward. Psychologists who take an essentialist position, such as Detterman and Thompson (ibid.) often tend to see children's attributes as fixed – they can't do it now, they won't ever be able to do it. However, those taking the sociological position, such as Barton (1988), by underplaying the role of the individual/self, can also, sometimes unintentionally, lessen the focus on the development of individual agency. Such conflicts tend to be played out in public policy debates, in fact there is, in 2011 and 2012, a significant debate about inclusion policy going on in the UK (ALFIE 2011). Such policy debates interpenetrate with teachers' ongoing thinking, and can be a significant source of uncertainty in terms of their day-to-day practice. For example, they might feel a general commitment to developing the autonomy of a child, but also wonder if there is not some truth to an essentialist position, that is if they can't do it now they might never be able to, and encouraging them might be setting them up to fail.

A key focus, therefore, of my exploration of teacher uncertainty in working with children with autism, is how they position themselves in relation to the child's agency and autonomy.

1.11 Sources of Uncertainty for Teachers working with Technology

The introduction of any new innovation in the classroom (whether technology based or not) can be considered as an impetus for teacher reflection on practice. As Dexter et al.(1999) indicate, when reporting on a large scale study of teacher perceptions of the impact of computers on their classroom practice, reflection upon their existing experience and teaching practice is noted as one

of the key effects of technology introduction. In the context of technology change, Hennessy et al. (2005) and Sandholtz et al.(1997) indicate that encountering new technology similarly requires teachers to consider how they will assimilate the innovation in to their practice, which typically stimulates them to reflect on their existing practice.

The introduction of innovation can concomitantly be a source of considerable anxiety and uncertainty for teachers (one could regard such uncertainty as the flipside of the process of reflecting on practice). In an important sense, in fact, technology innovations in the classroom can be considered similarly to other classroom interventions – i.e. the introduction of new technology can be understood in terms of change, and as Hennessy et al. (2003) suggest, we should conceptualize technology alongside the teacher-thinking literature that has focused on the impact of change on teachers and teaching.

However, there are strong indications in the literature that there is a specific type of anxiety and uncertainty associated with technology. In the human-computer interaction literature in particular, the construct “computer anxiety” is used to refer to a fear of computers when either using them or considering their use.

Chua et al. (1999) present a meta-analysis which correlates this construct with age and extent of computer experience. Russell and Bradley (1997),in reviewing the literature on the application of this construct to teachers, indicate that this shows that such anxiety is often related to a fear of “getting it wrong”, which itself is related to lack of knowledge and experience.

With the increasing penetration of technology into daily life, particularly in the last five years, it is of course important to question how this prior research applies to the second decade of the 21st century. There is a popular distinction, originally made by Mark Prensky (Prensky 2001a, 2001b), between “Digital Natives”, young people who are growing up with iPhones and iPads, with “Digital Immigrants”, those born before around 1980, for whom technology is something that they encounter, rather than grow up with. However, the strength

of this distinction has been challenged recently on empirical grounds. For example, at the recent Word Conference on Educational Technology and Media (Bastiaens and Ebne 2011), a number of studies of secondary school and undergraduate student attitudes indicated that it is not clear that positive feelings towards technology always directly correlate with age (Ranieri et al. 2011; Bullen et al. 2011). Nevertheless, Prensky does highlight at the least the potential for intergenerational conflicts about the significance of technology. Smartphone technology is associated for teenagers in particular with new modes of communication around social networking and instant messaging, and as such is likely to throw into relief for some teachers and schools differences between adult and adolescent identities. This is likely to be a source of anxiety and uncertainty for teachers working with adolescents. They may experience anxieties related to questions such as: Can I relate to these young people? What is the significance of this new technology for them and for me? Is there a place for me and my “old” knowledge in the face of these new ways of deriving and developing facts?

Further, for teachers working with young people with autism they might also ask: Can these young people join in with these new ways of communicating? Do their impairments in social communication mean that they are cut off from new ways of relating? Or, in contrast, does this technology offer them new ways to join in with their “normal” peers?

1.12 The Policy Context – teacher training and teacher knowledge

1.12.1 Scope

The focus of this study is on the experience of working with children with autism in the UK. When considering policy frameworks, implications and outcomes, although I make relevant reference to experiences in other territories, the UK experience is the primary field of study.

1.12.2 Autism Pedagogy and Teacher Training in the UK

As I will explore, although it is the subject of debate, there is a more or less accepted autism specific best practice pedagogy (Jordan 2008).

In some territories, teachers who are going on to work with children with autism learn about this in their initial teacher training. As Hegarty (1998) indicates, many European countries, as well as the USA, have a tradition of specialist initial teacher training for SEN teachers, who would in the past go on to teach in specialist provisions for children with SEN, although there is an increasing trend for such teachers to start and continue their careers in mainstream settings as well. In contrast, there has never been any established tradition of specialist education for teachers of SEN, at least in initial teacher training, in the UK. The historical reasons for this approach are not very clear. In a useful historical review, Hodkinson (2009) describes the development of SEN training in initial teacher education in the UK since the 1960s, but doesn't provide a rationale for this overall difference in approach. It could be argued that since 1980, UK education policy has been very heavily influenced by the social model of disability and sociological discourses of SEN. However, I have not identified any clear evidence to link this to policy decisions on teacher training. It seems possible that the relatively low levels of funding for initial teacher training in the UK may be equally implicated.

There is, as with teacher competencies and knowledge on SEN, virtually no extant literature on the issue of teacher training and ASD in the UK context. A search was performed on the broad spectrum education database, "Education Research Complete", using the search terms "teacher training" and "autism". Although a significant number of published papers were returned, these all related to research done in the USA or to the Far East.

Given that this study focuses on teachers working in a special school, it is relevant to consider what available evidence there is in relation to teachers specifically working in such schools in the UK. A search was performed on "Education Research Complete", using the search terms "teacher training" and

special schools. Only five relevant articles, two of which were media reports in the Times Educational Supplement, were located. This result seems to reflect a general lack of interest in the topic, certainly in the UK literature. In one of the articles, Parsons et al. (2009) report on a medium scale questionnaire-based study comparing the levels of satisfaction with their child's educational provision of parents of children with ASD and parents of children with other disabilities. It is relevant to note that there was only one minor qualitative reference in the reported study to perceptions of teacher knowledge and training. It seems difficult, therefore, to draw any robust conclusions on what level of specialist knowledge teachers in special schools in the UK have. However, given the lack of emphasis on SEN in initial teacher training, it seems reasonable to speculate that the level of specialist knowledge in special schools is not likely to be high compared to some other territories such as the USA.

1.12.3 The relevance of specialist knowledge

This study, in exploring teachers' uncertainty in working with children with autism, implicitly considers what they know about autism and autism pedagogy. It illuminates, therefore, albeit based on a very limited sample in one UK school, what teachers do and do not know about a) psychological theories about autism, and b) autism specific pedagogy, including the influence of their pre- and in-service training.

The question remains, however, as to what difference it makes whether teachers know lots or little about these domains. If their explicit knowledge is low, does this mean that they are poor teachers of children with autism? Or that they could be much better teachers if they knew more? Or that it does not make much difference? Would they be more or less uncertain?

The relevance of specialist knowledge about autism and autism pedagogy to the work of teachers in the study is, therefore, a key focus. Again, in exploring its relevance and significance, I employ a psychoanalytic lens. I specifically consider the implications of Bion's epistemology, and his thinking about the

place of theory in how the therapist comes to know the client. In doing so, there is a working assumption that there is something inherently uncertain in the relationship between therapist and client, and by extension between teacher and child, and that this uncertainty has a productive and generative aspect to it which can potentially lead to a useful “knowing” about the human other. It is in this context that I explore the actual significance of what teachers of autism do or should know about specialist expert knowledge about autism and autism pedagogy.

1.13 Towards a psycho-social approach to understanding teacher thinking and uncertainty

The title of the study is: “How do teachers deal with uncertainty in relation to working with children with autism in the context of the introduction of a new technology tool?” This specifies the key research question. The focus is on “how teachers deal with uncertainty”, and the study will explore how such uncertainties are expressed and can be detected, what teachers’ responses are when faced with uncertainty, what positions they adopt in relation to the children they are working with and in relation to a new technology tool in the context of such uncertainties.

The focus is on teacher uncertainty that arises from the (perhaps threatening) crucible of teachers working both with autism and with new technology, and how teachers deal, whether productively or destructively with such uncertainty. However, exploring how such uncertainties are expressed and can be detected requires the definition of a methodological approach.

I have already identified a split in thinking about SEN between psychological and sociological positions. This reflects, of course, a split with much wider applications about how to conceptualize the Human Sciences. On the one hand there is an orientation towards discrete categorisation, expressed in the preference for randomized controlled trials in both cognitive psychology but also in some strands of Social Science. On the other hand there is an orientation

towards “thick” descriptions and investigations which take into account more of the complexities of human social activity. David Byrne (2011), in exploring how these tensions are played out in Social Science, quotes Hayles (1999), who uses the term the “Platonic Backhand”:

> ‘The Platonic Backhand works by inferring from the world’s noisy multiplicity, a simplified abstraction. So far so good: this is what theorizing should do. The problem comes when the move circles around to constitute the abstraction as originary form from which the world’s multiplicity derives. Then complexity appears as “fuzzing up” of essential reality, rather than a manifestation of the world’s holistic nature’.

(Hayles ibid, p. 12)

This can be applied to diagnostic labels in SEN, and their potential misuse, in the psychological position as “abstractions as originary form”. Equally, it can be applied to the use of psychological or scientist orientations within Social Science.

There is also a second and related critique of the “psychological position” in respect of considering complex social fields such as teacher thinking. “Psychological” here refers to cognitive or clinical psychology. As Alvarez (1992) points out, these domains can be considered as reflecting a one person psychology. The psychologist acts as disinterested observer, turning their objective lens on the individual in order to discover particular attributes assigned to them such as attention, executive function, or ability in relation to theory of mind. There is no space for the relationship between psychologist and subject to be of significance, in fact the necessity for objective categorization precludes this. Further, the orientation towards objectively obtained categories in psychology has tended to reduce the ability of psychology to give explanations for human behaviour that properly reflect the rich complexities of human experience.

Psychoanalysis, as well as strands within humanistic psychology, has adopted a different position, which Alvarez terms a “2 person psychology”. Here the intersubjective relationship between the therapist and client is the key to deriving knowledge about human experience. This allows for a more in-depth capturing of the complexities of such experience and as a consequence the construction of a much more complex explanatory model for human behaviour. In this 2-person psychology, the psychoanalytic concept of desire tells us much more than psychology’s restricted term motivation ever could about what human beings are and why they act as they do.

It is possible to combine the two orientations implied above in relation to conceptualizing an appropriate theoretical and research position. A “social” interpretivist orientation which seeks thick descriptions and investigation of human experience can be linked to a 2-person “psycho” – logy which uses intersubjective experience between researcher and research subjects as a method to find out more about that complexity.

1.13.1 The hyphen in the Psycho-Social

Psycho-social studies, which make use of a combination of both psychodynamic theory and traditional approaches in sociology to understanding human experience and behaviour, is an emerging albeit still small area of cross-disciplinary study. There are considerable ongoing debates about how and to what extent psychoanalytic thought should be so integrated. I give some considerable attention to various aspects of these debates in Section 4.2
One key issue for the definition and adoption of a psycho-social approach in this study, is the particular debate within psycho-social studies about how the relationship between the individual and society should be conceived of when considering the integration of psychoanalytic thought in to sociology and social research methods. As Hoggett (2008, p.380) discusses, “strong social constructionist” approaches within psycho-social studies propose that too strong a focus on Freudian and Kleinian inner reality can eclipse a proper understanding of the social construction of human experience in which the

delineation between individual and society (or inner and outer reality) disappears or at least becomes more fuzzy. In this flavour of “psycho-social” studies, as Hoggett (op cit) notes, the hyphen, signifying the separation of inner and outer becomes superfluous, so the sub-discipline can be referred to as “psychosocial” studies. When such a position is adopted, making judgements about the inner reality of research subjects using techniques such as counter-transference can sometimes be regarded with a significant degree of suspicion. Hoggett (op cit) sets out the alternative position within psycho-social studies. In this, whilst one might maintain a healthy scepticism about too simple a conception of individuals as unitary subjects immune from the influence of social forces, there is also a recognition that, as Hoggett puts it, “I am nevertheless a realist before I am a constructionist” (op cit, p.380). In the realist flavour of “psycho-social” studies the re-introduction of the hyphen indicates that there is an acceptance of a) the potential of psychoanalysis to tell us something real about the individual experience and (importantly) desires of individual subjects, and b) the potential explanatory power of psychoanalytic techniques when adopted as social research tools. It is this realist flavour of psycho-social studies that I adopt in this study.
I will give the debates around psycho-social research methods further detailed consideration in Sections 4.2.2 and 5.3.5.

There has been increasing use of such a psycho-social approach to thinking about complex social fields such as teaching in recent years. For example, Price (2004) uses this approach to think about the emotional context of young children’s literacy learning. However, it is still early on in the use of such an approach, and there remain a number of open issues related to epistemology, validity and reliability.

I intend to use such a psycho-social approach in my detection and evaluation of teachers’ uncertainties about working with children with autism. In doing so I will also explore some of the extant methodological issues involved with the application of this approach.

2. Teacher Thinking

2.1 Teacher Thinking – Cognitive Approaches

There is a significant literature on teacher thinking, which explores how teachers come to decisions about what they do in the classroom. There was significant interest in teacher thinking in the 1980s and early 1990s.

As Denicolo and Kompf (2005) discuss, in a later exploration of this body of work, teacher thinking can potentially be delineated temporally, as:

1. Teacher planning in advance of lesson delivery
2. In the moment, thinking about strategy selection
3. Reflection on what went on in the classroom after the lesson

The researchers involved, however, were most interested in the “in the moment” thinking about strategy selection, as indeed I am in this study. The most important decisions or the most significant thinking, which influences what teachers actually do, will occur in this crucial arena of the classroom itself. This is of course related to planning processes, and there is some attention given to such processes in the teacher thinking literature. But given the extreme practical difficulty of eliciting teacher thinking during the lesson, teacher reflection after the lesson was naturally seen as the most obvious route to uncovering what teachers had been thinking in the moment.

Much of the teacher thinking literature was what Denicolo and Kampf (2005) term cognitive in approach, in that it aims to uncover specific thought-action sequences and aims to uncover how teachers make decisions about what to do in the classroom. It illustrates how specific methods can be used to inquire of teachers about their thinking in relation to particular observed events in the classroom, although as teacher thinking studies accumulated, it became clearer

that “uncovering” thought-action sequences from after the fact elicited teacher reflection was far from straightforward.

I consider this literature as being highly relevant to my study for a number of reasons:

1. Exploring teacher uncertainty necessarily implies exploring what teachers think about working with children with autism. In one sense, exploration of teacher uncertainty and exploration of teacher thinking are, if not identical, then very closely related.
2. The teacher thinking literature emphasises what goes in the moment of teacher-to-child interaction, even if it is not always able to research this directly. Similarly, my exploration of uncertainty focuses on the exploration of how teachers deal with uncertainty and its relevance for their practice in the teaching “moment”.
3. Following on from (1), methodological considerations, methods and experiences reported in the teacher thinking literature will be relevant for the approaches adopted in this study

2.2 Approaches to investigating teacher thinking

Most of the empirical studies are based on unstructured or semi-structured classroom observations, followed by teacher interviews in which teachers are asked to report on their thinking in relation to particular actions observed in the classroom. Clark and Petersen (1986) and Clark (2005) review the methods used. They highlight the use of stimulated recall interviews, in which classroom vignettes are used to stimulate responses from teachers on the thinking behind their actions. Clark (2005) and later Brown and Mcintyre (1993) note, perhaps not unsurprisingly, that teacher reports seem to be more comprehensive if the they are stimulated very soon after the classroom activity to which they refer.

2.3 Categories of Teacher Knowledge

Coming from a cognitive position, Shulman (1987) usefully proposes a categorization of the teacher “knowledge base” as:

- content knowledge
- general pedagogical knowledge
- curriculum knowledge
- knowledge of learners
- knowledge of educational contexts
- knowledge of educational ends, purposes, and values, as well as their philosophical and historical grounds
- pedagogical content knowledge

Pedagogical content knowledge is a type of craft knowledge which relates to teaching specific subject areas. So, for example, a science teacher would have particular working theories about how best to explain or demonstrate key concepts such as transpiration or the structure of the atom. This is partially derived from training or reference to, say, schemes of work, but also partially derived from their experience of what works in explaining things to children. This concept could usefully be extended to craft knowledge associated with working with particular groups of children. So, for example, we could posit the existence of pedagogical content knowledge about how to work with children with autism.

2.4 Common Themes in the Cognitive Literature

There are a number of common themes that emerge from the empirical reports on teacher thinking (Clark & Petersen 1986; Brown & McIntyre 1993; Calderhead 1987; Peterson et al. 1978).

Rapid thinking

Across the literature, it was very rare to gain accurate reports on specific thought sequences taking place before actions. The complex nature of teacher's professional practice, with events involving many participants happening very rapidly contributed towards this. If we consider a teacher being presented with 10 children asking for help simultaneously, we can see that they need to decide what to do very rapidly and when asked even a short time later what their thinking was, they would find this hard to articulate. This difficulty in recall in relation to rapid and complex activity in the classroom was reported across the literature.

Little direct reference to theory and Chunking

Teacher reports on their thinking included relatively few references to explicit theory and knowledge. In Shulman's terms, general pedagogical knowledge, knowledge of educational contexts, knowledge of educational ends were rarely referred to. Although content and curriculum knowledge, and knowledge of learners and educational contexts were much more clearly present, it tended to be assimilated into higher level categories such as an overall concept of pupil progress. As Peterson, Marx and Clark (1978) put it, teachers tended to engage in "chunking". By this they mean that teachers tended to group both events and knowledge in to a few categories. The typically reported use of broad groupings of children by ability in the empirical reports ("the higher ability ones can do this") is an example of grouping of knowledge; in this case about learners.

2.5 Schön – Reflection in Action

One of the theorists who has had most influence on thinking about "thinking in professional practice" in general and teacher thinking in particular is Donald Schön. In his hugely influential book "The Reflective Practitioner" (Schön 1983), he identifies the growth in the influence of the professions and professionals since Word War Two and the dominance of science and positivism in

determining both their prominent role in technological societies and in conceptualizing their activities. Schön describes this as the ”Technical Rational” model, where privileged major professions (medicine, law etc..) take a body of scientifically derived knowledge and then apply this to solve clearly defined and delimited problems. Further, in this model, a second class of minor professions are ineluctably defined, such as teachers or social workers, where an ill-defined knowledge base and competing sets of theoretical explanations are targeted (ineffectually) at fuzzy real-world problems. Schön criticizes this model on a number of grounds. One of his key points is that the technical rational model does not work in many cases, and that, increasingly, the recipients of the professional services and the professionals themselves realise this (the growth of the expert patient movement might be an example of this). Specifically, the technical rational model only works for “convergent cases” which fit the textbook parameters. Yet Schön proposes that in fact in many (or most) cases, the textbook does not fit or quite fit, and the professional needs to use their ”in the moment” thinking to find the solution to the problem – in other words, thought and action are intertwined. Further, Schön points out that these messy problems are actually quite common in both the major and the minor professions, and that the distinction between the professions on those grounds is really a false one. Schön names this process “Reflection in Action”. So in common with the teacher thinking literature, Schön was particularly interested in what went in the ”moment” when professionals engage with problem solving, although he certainly considered how professionals engage in planning and after the fact reflection.

However, there is significant debate, and I would suggest a certain lack of clarity about:

1. What Schön actually means by “Reflection in Action” and what he is suggesting actually goes on “in the moment” when professionals come up with solutions to professional problems.
2. Concomitantly how Schön sees professionals integrating expert/theoretical and tacit knowledge gained from experience “in the moment”.

2.6 Socio-cultural approaches to Teacher Thinking

As Denicolo and Kompf (2005) point out, part of the reason for the decline in interest in teacher thinking as a field of study after the 1980s was due to the growing influence of socio-cultural approaches to conceptualizing what is going on for teachers and children in the process of teaching and learning in the classroom. This was, as Denicolo and Kompf recognise, to a significant degree due to Schön's influence. Schön's rejection of a technical rational model of professional thinking tends to imply that tacit knowledge is just as important as expert knowledge. It's not a major jump from this position to considering process and product in professional thinking as intertwined and even indistinguishable. This is the socio-cultural approach, where in contrast to cognitive approaches, it is seen as unsupportable on both empirical and logical grounds to contend that thoughts and actions can be separated. In this perspective, the difficulty that cognitive teacher thinking encountered in uncovering teacher thinking processes is seen as hardly surprising.

As I will discuss in Section 2.7 below, it's not quite so clear whether Schön was in fact adopting a socio-cultural position. However, many interpreted him in this way and perhaps partly in reaction to this, there was less interest in cognitive approaches to teacher thinking after the 1980s, and much more interest in narrative and hermeneutic accounts of teacher thinking. This body of literature, from the 1990s onwards, is usually referred to as ”teacher research” (Ballet, Kelchtermans and Loughran 2006).

2.7 Where does Schön sit in the split?

A typical reading of Schön is that he is adopting a socio-cultural position similar to Lave and Wenger's situated cognition theory, which takes apprenticeship situations as the exemplar of how the process of learning really happens, and argues that this process is what is really going in “academic” contexts such as

classroom learning. Hanks (1991), in his introduction to Lave and Wenger's (1991) seminal text, considers their concept of "legitimate peripheral participation":

> "The individual learner is not gaining a discrete body of abstract knowledge which (s)he will then transport and reapply in later contexts. Instead, (s)he acquires the skill to perform by actually engaging in the process…" (Hanks 1991, p.14)

As Erlandson and Beach (2008) point out, for Lave and Wenger, in common with socio-cultural theorists such as Leontiev (1959) and Rogoff (1990), the acquisition of the skill and the engagement in the process are indistinguishable. The knowledge or skills gained cannot be considered as separate from the embodied practical engagement with the process. Process and product are the same and, further, it makes no sense to think about a wholly separate individual cognition that is distinct from the tool-supported interpersonal interactions that the mind emerges from. This is the socio-cultural position and in proposing that knowledge arises from engagement with professional practice, Schön could be seen as being in line with this. Erlandson and Beach (op cit) identify the following conclusions which can and have been drawn if Schön is read like this:

> "that for practice-oriented professions that rely on tacit knowledge, such as those of architects, psychotherapists, nurses and teachers, there is a special kind of epistemology that differs from epistemology in the classical sense; that this epistemology is situated such that questions of epistemology have to involve questions concerning situated practice; these practice-oriented professions involve a special kind of situated thinking and this 'situational thinking' is what being a professional is all about." (Erlandson and Beach op cit, p.411)

However, Erlandson and Beach (2008) and prior to that Erlandson (2007) note that the alternative position from the socio-cultural - the cognitive/rationalist position, does very much hold to the idea of a de-situated mind that is separate in many ways from the world that it acts upon. Erlandson (2007) terms this the

”control matrix”, which is essentially the idea of the homunculus, the independent ”I”.

Erlandson and Beach (2008) then go on to show that Schön is, in fact, quite closely aligned with this psychological position and that for Schön, reflection in action implies that there is an active construction of an abstract concept that then drives action. This might happen very quickly – in the moment, but it still happens in that order – abstract thought and then action.

At this point I should make my own ontological position clear. My interpretation of Schön is that he responds, perhaps implicitly but in my view inescapably, to the significant problems that many people have with many socio-cultural accounts which position the mind as the ”individual-in-social-action” as Cobb (1994) puts it. As Magee (2000) points out, accounts such as this, which minimize the role of a privileged individual cognition, inevitably tend to reduce the space available for the exercise of individual agency. Yet, as Magee eloquently explores, everyday practices across cultures, are based on an assumption of individual agency. Try stamping on someone’s foot when you pass them in the street and then explaining it as a consequence of socially mediated acculturation to see how it works out for you and the stampee in real life practice! Magee, of course, based on Kant’s Critique of Pure Reason, goes further, and commits 21st century philosophical political incorrectness by, in effect, defending Cartesian duality. According to Magee, if we accept individual agency, then there must be something outside of the phenomenal world to account for this, something we might call the mind, divorced from the phenomenal body.

So Erlandson and Beach’s critique of Schön is correct, but for those who think that more rather than less emphasis needs to be given to individual agency in accounts of professional thinking, the response to this critique would be that Schön is in fact right in leaving space for the individual control matrix. So I would interpret Schön as maintaining that in the process of professional thinking, the individual mind engages in abstraction and development of concepts first, and then applies it in practice. However, this still leaves us and

Schön with a problem if we are not to fall back into the extreme split between knowledge and practice present in the Technical Rational model, and Schön does demonstrate convincingly how this model doesn't fit with what actually goes on in professional practice. The problem is, therefore, what does happen ”in the moment?”

Schön tends to skip over this crucial issue, which is the most problematic aspect of his account of professional thinking. Erlandson and Beach argue that the best way of explaining this it to turn to socio-cultural accounts of the mind as embodied practice. If this is rejected, as I reject it, based on concerns to preserve a space for conceptualising individual agency, then what explanation do we have for how a body of professional knowledge is utilised and applied in the moment by professionals in action? More specifically, how do we account for what goes on when caring professionals, including teachers, work with clients or children about whom they have significant levels of uncertainty? How does their intersubjective relationship with the human other relate to expert knowledge and how do they make use of or integrate these knowledges “in the moment”? For me, Schön's concept of ”Reflection in Action” as it stands leaves these questions wide open.

In Section 4 below, I will explore how using a psychoanalytic lens, and in particular Bion's epistemology about how the therapist and client move from ”not knowing” to ”knowing” could allow us to fill this theoretical gap and consider more fully how teachers and other caring professionals integrate theory and expert knowledge in their moment-to-moment encounters with the human other.

2.8 Intersubjectivity

I have referred to the term intersubjective relatedness in discussing how reflection in action relates to the caring professions. I wish to use it in quite a similar, although by no means identical fashion to the way the term “primary intersubjectivity” is employed in developmental psychology. Originally coined by Bateson (1979), Trevarthen and Aitken (2001) explain it as follows:

> “The social intelligence of the infant is evidently a specific human talent—an inherent, intrinsic, psycho- biological capacity that integrates perceptual information from many modalities to serve motive states. Moreover, this capacity is a necessary prerequisite, although not in itself a sufficient cause, for a child to go through psychological development of the kind that leads to and depends on cultural learning...the infant’s need for communication animates the initial self-other awareness and reception of motives and emotions in the intersubjective messages that underlie all language—a ‘‘human sense’’ that emerges in progressively more powerful forms through the course of infancy... Regulation of this primary human communication depends on an innate ‘‘virtual other’’ process in the infant’s mind... Researchers found that as early as 2 months, infants and mothers, while they were looking at and listening to each other, were mutually regulating one another’s interests and feelings in intricate, rhythmic patterns, exchanging multimodal signals and imitations of vocal, facial, and gestural expression....Mothers and fathers were behaving in an intensely sympathetic and highly expressive way that absorbed the attention of the infants and led to intricate, mutually regulated interchanges with turns of displaying and attending. The infant was thus proved to possess an active and immediately responsive conscious appreciation of the adult’s communicative intentions. This is what was called primary intersubjectivity...” (Trevarthen and Aitken, ibid, p.4)

Wilfred Bion’s ideas concerning how we come to know by relating to the human other, further discussed in Chapter 4, seem to a certain degree to be in resonance with this account of primary intersubjectivity. In particular, Bion in his call to the analyst to work “without memory or desire” similarly foregrounds a type of person-to-person communication where formal cognitive processes play, at the very least, a background role (see Section 4.3.1.2 below). However, it is important to note that whereas Trevarthen and Aitken’s (op cit) account is based on a materialist, almost neurocognitively automatic account of how such communication comes about, Bion’s idea of intersubjective relatedness builds

on Klein in focusing on the developmental struggle and often the pain involved in relating to other people.

However, in his later theoretical developments, Bion develops an account of the coming to know the human other, which is explicitly both transcendentally idealist and mystical in conception. As such, Bion's conception of intersubjective relatedness is similar in some ways to ideas found in some religious traditions, such as the ideas of Martin Buber on "I-It" and "I-Thou" relationships. Jopling (1993, p.292) summarizes "I-It" relationships as occurring when "the primary focus of the relation involves treating the other person as predictable, explainable, manageable, or intelligible. The other person is information bearing..(and) is the subject of what..be called..the objective attitude". In contrast, "I-Thou" is "characterized by mutuality, presentness, exclusiveness and intensity; it is a non-objectifying relation; the relation is lived, not known or described. To try and identify..it...is to be outside it". Importantly, although Jopling tends to underplay it, Buber predicates the idea of a human-to-human "I-Thou" relationship on the existence of a human to God "I-Thou" relationship. The former is not possible without the existence (although not the acknowledgement) of the latter.

It is my intention in chapter 4 to further explore the potential for an account of intersubjective relatedness based on Bion's account of how humans come to know the other to fill the "gap" left by Schön in conceptualising what happens in the individual's mind during reflection in action. However, the remainder of this chapter addresses teacher thinking specifically in relation to the use of educational technology in the classroom.

2.9 Educational Technology and Teacher Thinking

2.9.1 The Impact of Technology on Learning

This topic has received by far the most attention in the educational technology literature. There are a number of reasons why this is the case. From the viewpoint of both policy and pedagogical practice, given the huge investment of money, resources and teaching effort in the implementation of ICT in schools throughout most developed countries, evaluating the results of this effort in terms of the primary task of schools – children's learning - has not, surprisingly, been a focus for both government and educational researchers.

Some of the literature on the impact of technology on learning is based on a linear model of the relationship between teaching and learning. As such it focuses on quantitative outcome measures based on attainment or grade scores. For example, Somekh et al.'s (2007) report, based on a relatively large-scale analysis of the relationship between the level of use of ICT and attainment test scores , showed that test score improvements were more significant in primary than secondary schools.

However, the ability of such quantitative outcome-based approaches to provide explanatory models as to why technology does (or does not) have an effect is limited. In fact, as Cox (2007) points out, the educational technology literature since the early 1990s tends more to be rooted in the recognition that teaching and learning are complex, multi-faceted activities, and that a range of methodological tools are necessary to properly understand the potential mechanisms by which technology can affect processes of learning and teaching. Thus, as Cox (ibid) discusses, in educational technology research, it is increasingly common to find research models encompassing both quantitative and qualitative methodologies aimed at producing both outcome measures and qualitative measures that reflect the experience of the users of the technology

and the ways in which they do or do not incorporate that technology in their existing practices. In the HANDS project, this PhD sub-project was one important way in which this qualitative aspect was addressed.

Educational technology research might be considered, therefore, as exemplifying one practical resolution of the preceding decades' "paradigm wars" (further discussed in Section 4.1.5 below), where "scientific" approaches which isolate subject, intervention and outcome are traditionally positioned in opposition to more interpretivist approaches. Increasingly, mixed mode approaches in educational research generally and educational technology research in particular, are becoming more common. The HANDS project, and the PhD sub-project embedded within it, are an example of this, as noted in the opening chapter.

Understanding how and why educational technology may make a difference to teaching and learning has been a focus of interest in much of the literature. It is not, however, my intention here to comprehensively review the wider (voluminous) literature on how technology mediates processes of learning and teaching. My interest is on a) how the introduction of innovation per se can stimulate teachers to reflect on their practice, and b) what anxieties, uncertainties and emotions the introduction of new technology, particularly mobile technology designed to develop social and life skills, may elicit in teachers working with children with autism.

2.9.2 Teacher Attitude Towards Technology

In Section 1.11 I reviewed some of the literature on teacher anxiety and uncertainty in relation to computer use. This is just one segment of the broader literature on teacher attitudes and perceptions in relation to the introduction of technology. Again, I don't intend to review this in great depth, but it is nevertheless relevant to identify some of the key themes. Wozney, Venkatesh and Abrami (2006) in their review of the literature, list the following factors that

can influence teacher attitudes towards the introduction of technology in the classroom:

- the quality of professional development offered to teachers
- the extent to which administrative and curricular support is available to teachers
- the quality of teacher access to computer resources
- personal and demographic factors related to teachers

Ertmer and Ottenbreit-Leftwich (2010) identify essentially the same set of factors, but focus more closely on the last category, particularly pre-existing teacher attitudes. They propose that teachers will tend to have a positive or negative attitude to the potential use of technology in the classroom based on the following sub-factors:

- Existing attitude towards technology generally
- Existing belief systems about technology use in the classroom, for example the belief that good teaching can be achieved without the use of technology
- Lack of relevant knowledge about the technology in question, which can include lack of technical knowledge and lack of knowledge about how it could be integrated in to their pedagogical practice
- Low self-efficacy in relation to their ability to effect change in their classrooms and/or their ability to use technology effectively in educational settings

Ertmer and Ottenbreit-Leftwich (ibid) propose that teachers' overall pedagogic orientations can also influence their use of technology. They consider this orientation as a type of existing belief system, and propose that teachers with an orientation towards transmission based pedagogy will be less likely to have a positive attitude towards technology than teachers with a social constructivist orientation.

There are any number of standardized scales measuring teacher attitudes towards technology, which use a number of constructs, and also allow for analysis based on demographic factors. Examples include Christensen and Knezek (2009),and Gardner, Discenza and Dukes (1993). There has also been significant use of the Technology Acceptance Model (TAM), see Davis 1989, and Bagozzi and Warshaw 1990, mainly used initially in commercial contexts. In TAM, the user's "acceptance" and ongoing use of a piece of new technology is based on two key constructs – perceived usefulness and perceived ease of use. Perceived usefulness is the degree to which someone believes the technology will help them do their job better, and perceived ease of use is the degree to which someone thinks they will not have to expend much effort in using or adapting it. Perceived ease of use is crucial if teachers are to adopt new technology. Faulty and unreliable software in particular can have a significant deleterious effect on user acceptance.

These two constructs seem very relevant to teachers' experience of using technology. As Cuban (2001) points out, classrooms are littered with technology that teachers did not use, and did not integrate in to their practice, and very often this is because, on a personal professional level, they could not see how it was going to help them and/or thought it would not be worth the sometimes considerable effort to get to know how to use it properly. Examples of the use of TAM in respect of teachers include recent work by Teo and Noyes (2011) and Holden and Rada (2011). A search using the terms "Technology Acceptance Model" and "Teachers" on the Education Research Complete Database reported 48 school-based studies that had used the TAM between 2002 and 2011.

However appealing the TAM may be, like the other instruments designed to operationalize teacher attitudes and measure them using standardized scales, it is based on a particular epistemological stance derived from cognitive science. As Oliver (2011) points out, there has been significant criticism of the unquestioned use of such approaches in thinking about the complexities in play when teachers and children encounter technology. Nevertheless, both quantitative and qualitative approaches to thinking about teacher attitudes serve

to place a focus on the importance of the relationship between teacher and technology, and at least point us in the direction of considering what feelings and emotions may be at play when this encounter occurs.

2.9.3 Emotional Involvement with Technology

There has recently been increasing interest in the ways in which users can develop an emotional connection to technology. There has been growing interest particularly in relation to the ubiquitous use of mobile phones and the realisation that as technology penetrates more and more into every day life, concomitantly people may increasingly invest feelings in technology.
Working within the Human-Computer Interaction field, Meschtscherjakov (2009) and Wehmeyer (2007) use the terms “user attachment” or “user emotional attachment” to signify that mobile devices can act as an expression of an individual’s personality or as a symbol for group membership, and as such act as an extension of or form part of an individual’s sense of identity. Wehmeyer (ibid.) and later Geven et al. (2008) note that personalisation (i.e. the tailoring of mobile phone functions such as wallpaper, screensavers etc.,) can be one aspect of the process whereby users become “attached” to their mobile devices on an emotional level.

Coming from a Persuasive Technology perspective, Fogg (Fogg 2003; Fogg and Eckles 2007) propose the concept of “mobile marriage”, whereby, based on repeated interactions over a period of time, an intensive positive relationship between the user and the device is developed. These repeated interactions typically will involve phone functions such as the use of SMS, Internet, Social Media etc. The development of this positive relationship increases the perceived credibility of the mobile device.

This developing literature is, of course, currently focused on the relationship between the general user and technology, and the focus is not on education but more commonly on how commercial applications on mobile devices can be used to sell things more effectively. Nevertheless, there is a potential

application of the idea of "user emotional attachment" to the interaction between teachers and technology in the classroom, particularly mobile technology as in the case of this study.

This approach also echoes a "narrative" or ethnographic perspective strand within the teacher research and teacher thinking literature, which considers responses such as commitment and resistance that teachers may experience when faced with incorporating technology into their practice (see Section 2.9.4 below).A psychoanalytic perspective on the feelings involved when teachers used technology may have something to add, in that it might allow for the application of the idea of desire, with all its attendant explanatory potential.

2.9.4 Innovation's Role in Stimulating Reflection on Practice – the link to Teacher Thinking

As I indicated in Section 1.11 above, a number of studies (Dexter, Anderson and Becker 1999; Hennessy, Deaney and Ruthven 2003; Sandholzt, Ringstaff and Dwyer 1997) indicate that encountering new technology requires teachers to consider how they will assimilate the innovation into their practice, which typically stimulates them to reflect on their existing practice.

The role of change and/or innovation in stimulating reflection on practice has also played a role in the later teacher research/teacher thinking literature. This is particularly the case for narrative, ethnographic and action research approaches, which focus autobiography and storytelling as the best routes to conceptualizing teacher thinking (Kelchtermans 1993). Strong-Wilson (2008)reports on a study where the introduction of a new interactive whiteboard application was considered as a stimulus for teachers' reflection on what they know and how they use that knowledge in their professional role. It captured records of collaborative face-to-face working groups, "reflective" interviews and an online blog, where teachers record their on-going experiences of using the

new technology. Based on this data the author considers the balance in the teacher's minds between commitment and resistance to change.

This theme of commitment and resistance to change and the balance between them is a recurring one in the wider teacher research/teacher thinking literature on teacher responses to intensification. Ballett, Kelchterman and Loughran (2006) in reviewing this literature, define intensification as the increase in demands and pressure on teachers in response to policy drivers based on a technical-instrumental view of education. This consideration of intensification from a political policy perspective results in a focus mainly, but not exclusively, on how and when teachers' competency is assessed in terms of externally imposed instrumental goals. This can lead, for some teachers, to a sense of de-professionalization. Such concerns are of course often relevant when considering teacher reactions to new technology, particularly where it might be perceived as part of a wider programme of external impositions. However, intensification implies change and the identification of responses to change in the literature are highly relevant for this study in that it flags up some interesting ways in which teachers can respond to change.

2.9.4.1 A focus on a care ethic

Ballet et al. (ibid) note that several studies, for example Shacklock (1998), indicated the primacy of a care ethic (Noddings 2006) for teachers, in that, as they put it, "teachers "are willing to do anything in order to safeguard and continue the personal and caring relationships with their students" (Ballet et al. ibid, p.214). These studies suggest that when faced with change, teachers may respond selectively to external demands, particularly if they see these as being in conflict with a care ethic.

2.9.4.2 Filtering through their personal interpretive framework

Ballet et al. (ibid), drawing on a number of action research/narrative based studies of teacher response to change (such as Kelchtermans 1993) indicate that teachers respond to intensification in different ways, depending on their

"personal interpretative framework" (Kelchterman's term). This includes both their personal beliefs and their overall conceptualization of how they act in the classroom.

We can also potentially conclude that teachers' response to change, whether in the context of "intensification" or not, are also mediated through their personal beliefs and experiences, and furthermore that this mediation, certainly from an autobiographical or narrative perspective, involves them in some way in thinking about how the change relates to both their personal beliefs and their existing practice. For some teachers, their reaction may be one of resistance, for others one of commitment.

The thinking behind the adoption of these positions is likely to stem from a complex interaction of personal experience and personal beliefs about themselves as teachers and about how they act as professionals in the classroom, as well as structural factors, such as their position in the school hierarchy, school management styles and the level of support offered in dealing with specific changes.

2.9.4.3 A Psychoanalytic Perspective –Identifications and Uncertainties

We might, however, usefully further propose that in considering teacher positioning in relation to change, their emotional valencies and identifications may also be relevant. "User emotional attachment" and the Technology Acceptance Model are one way of conceptualizing this. However, perhaps a richer exploration could be achieved by the application of a psychoanalytic lens to thinking about how innovations introduced in to the classroom are related to by teachers, and what particular identifications might be projected onto the technology. Further, perhaps mediated by these identifications, change involving technology is likely, for many teachers, to generate significant anxiety and uncertainty. This may be directly related to identifications about technology per se, but may also be related to the change signified by the new technology. Reactions such as resistance and commitment discussed in the wider literature signal the varying emotional reactions to such changes. As teachers take up

such positions it is likely that they go through a significant period of anxiety and uncertainty as to how this change relates to their existing practice, to their identity as a teacher, and to the relationship between them and the children they are working with. In this study, where the technology is specifically designed to develop social and life skills in children with autism, issues such as agency and autonomy, and the teacher's perception of these in children with autism are likely to be activated as well, potentially leading to even more uncertainty about both what the significance of the technology is and how it can be used.

3. Autism Spectrum Disorders, Impairment and Exclusion

3.1 What is Autism?

The Diagnostic and Statistical Manual of Mental Disorders Fourth Edition DSM-IV (American Psychiatric Association 2000) following Wing and Gould (1979), the psychological definition of autism *par excellence*, defines the condition as marked and qualitative developmental impairments in three fields of behaviour —*'the autism triad'*:

(1) Qualitative developmental impairments in reciprocal social interactions and socialisation
(2) Qualitative developmental impairments in reciprocal communication (both verbal and non-verbal)
(3) Qualitative developmental impairments in flexible organisation of behaviour and interests (repetitive and stereotypic activities, restricted and stereotypic interest)

Volkmar et al. (2005) also consider the wider set of behaviour and conditions commonly associated with autism spectrum disorders, although not forming a part of the DSM-IV categorization. They note that ASD is frequently associated with problems of over or under-sensitivity to external stimuli such as sounds, touch, taste, smell and light or colours.

There are also frequently problems with emotional regulation, as well as a demonstration of unusual behaviours such as echolalia, or stereotypies such as the flapping of hands, which may act as "self-soothing" compensatory regulatory mechanisms.

There is a clear co-morbid incidence of moderate to severe learning difficulties, certainly in cases of classic autism, which may be exacerbated by organizational impairments, which hinder effective engagement in learning.

There is also a significant incidence of co-morbid conditions, including ADHD and dyspraxia or developmental motor communication difficulties. Secondary effects due to anxieties provoked by the condition also lead to a significant incidence of depression and other mental health issues, particularly in adolescence.

The definition of the autism triad in DSM-IV identifies what are usually accepted to be the defining features of autism. Nevertheless, there are varying perspectives on how to conceptualize Autism Spectrum Disorders. As noted in chapter 1, many adopt a sociological position where, although the existence of an underlying impairment is acknowledged, the focus in terms of categorization and overall approach is based on how societal factors serve to create disability. In my view, the frequent eschewing of a deficit model by those adopting this position tends to reduce the emphasis on the biological basis of the condition and the extent and consequences of the impairment.

3.2 The neurobiological basis of autism

Rutter (2011) reviews recent studies showing atypical neurological development in people independently assigned an autism diagnosis. He also notes that extensive twin and family studies, some of which, including Rutter (2005), have only been reported in detail in the last six years, indicate that autistic spectrum disorders have an “overall” heritability of about 90% (p.399). As Rutter (2011) points out, the identification of this overall genetic predisposition does not map in any simple or predictive way onto autism as a phenotypically heterogeneous syndrome, and no specific genes linked to autism have been identified. However, when the overall neurological and genetic data available are considered together, it is clear that there is fundamentally a neurobiological basis to autism, although we are still very far away from connecting these neurobiological findings in any useful way to questions of how people with autism experience life and how therapeutic, educational and social interventions might be designed to help support them.

3.3 A Broad Spectrum: Asperger's Syndrome and High Functioning Autism

Asperger's syndrome was included in the DSM-IV 1994 (APA 1994), although by definition autism was given diagnostic precedence. It is differentiated from High Functioning Autism by relatively late onset of the condition, more normal development of early language, occurrence of circumscribed and obsessional interests and some incidence of poor motor functioning. In a later consideration of the effects of her seminal 1981 paper, Wing (2005) notes that it led to an increasing understanding amongst clinicians and other professionals that autism spectrum disorders are a *broad* spectrum with a wide range of expression.

3.4 Cognitive Theories in Autism

Györi (2006) usefully provides a summary of the main theoretical explanations from cognitive science that have been put forward to explain typical deficits in autism spectrum disorders.

3.4.1 Theory of Mind

Originally proposed by Baron-Cohen, Leslie and Frith (1985), 'Naive theory of mind' (ToM) is the a cognitive construct equated to the human ability to attribute mental states to other social actors and as such enable us to make sense of their social behaviour (Györi 2006). This ability plays a central role in social interactions, and could be regarded as what makes the actions of others meaningful for us. Happé (1993) suggests that naïve theory of mind ability plays a key role in both verbal and non-verbal communication. She argues that this is because all communication is essentially communicating intentions or recognising intentions, and if intentions are mental states, then communication requires theory of mind ability.

According to Györi (op cit), deficit in ToM works well as a cognitive construct as it provides a good explanation of two of the definitive traits in autism – impairment in reciprocal social interactions, and in reciprocal communication . A significant number of empirical studies have demonstrated that people with autism have, when compared to the general population, an impaired theory of mind ability, although as Györi notes, this impairment is not uniform, and there are still some children with autism in some of these studies who do not fail either first or second order tasks (see for example Bowler 1992). Györi also notes that Theory of Mind also cannot give an account of a number of other common traits in autism, such as the incidence of unusual skills and obsessive interests. Yet despite these limitations, ToM does at least seem a useful construct for those working with people with autism, as it does seem to some degree to correspond with the experience of interacting with people with autism.

3.4.2 Executive Function

Ozonoff, Pennington and Rogers (1991) define executive function as follows:

> "Executive function is defined as the ability to maintain an appropriate problem- solving set for attainment of a future goal; it includes behaviours such as planning, impulse control, inhibition of pre-potent but irrelevant responses, set maintenance, organised search, flexibility of thought and action." (ibid, p.1083)

As Györi (2006) points out, executive function defined in this way is a requirement for complex routine and non-routine cognitive processes. The third part of the autism triad (see Section 3.1 above) does seem very close to this definition of impairment in executive function. A range of studies have shown that people with autism perform badly on cognitive tests of executive function (see for example White et al. 2009; Kaland et al. 2008). However, as Happé, Ronald and Plomin (2006) point out, accounts of autism purely based on executive function impairment fail to account for the significant social impairments also seen in autism. This is particularly so as executive function

impairment is also seen in other conditions such as ADHD, where there is no similar impairment in social functioning.

3.4.3 Weak Central Coherence

Frith (1989) introduced the construct of general coherence, which she equates to a general characteristic of human information processing. In a later paper it is defined as “a tendency to draw together diverse information to construct higher-level meaning in context” (Frith and Happé 1994, p. 121). In other words, when presented with a set of external information, mental processing accounts for the overall context or ”gist” of the situation, which equates to central coherence. Györi (op cit) notes that Frith proposed that the impairment in central coherence in autism could account for many of the traits in the syndrome, including problems with perceptual integration; restricted interests; obsessive desire for sameness; insistence on maladaptive routines; an uneven cognitive profile; preoccupation with object parts and narrowed and stereotypic interests. Frith and Happé (1994) also suggested that variations in central coherence may also explain some of the special cognitive strengths manifest in some people with autism. In their later paper, Happé and Frith (2006), use the example of some people with autism being able to identify many different types of vacuum cleaner just by listening to them or being able to identify a misplaced book in a large bookcase in a few seconds. More widely seen strengths could include strong rote memory or the ability to recognize faces upside down.

Weak central coherence is also seen as having potential explanatory potential for the frequent incidence of sensory processing difficulties in people with autism. As Happé and Frith (ibid) note, the lack of context based interpretation implied by weak coherence could be related to a lack of modulation of sensory experience, i.e. in neurotypicals with strong coherence you filter sense data so that you get a “gist” of the whole experiential scene in context, and it is this filtering which is impaired in autism.

3.4.4 A Core Aetiology?

Happé et al. (2006) consider the highly significant issue of whether there is a common core aetiology in autism. As the authors note, much of the genetic, neurological and cognitive research activity in relation to autism has as an underlying motivation the hope of identifying a unified source problem, which once identified can then be cured. Happé et al. (op cit) concluded that the available data across domains points away from such a unified core impairment. Genetic studies suggests that “half the genes that contribute to variation in social (dis)ability are independent from those that contribute to variation in communicative skills or rigid/repetitive tendencies.” (op cit, p.1219). Cognitive accounts also fail to identify a primary deficit that can plausibly account for the full triad of impairments. The authors then propose that it is time to give up on the search for a common aetiology. They are then, of course, faced with the problem of explaining the very common clinic co-incidence of the triad of impairments. They make an appeal to genetic overlap and new developments in molecular genetics. However, as Rutter (2011) points out in their later review, findings from this field are very much exploratory and inconclusive. What Happé et al.’s paper (op cit) does usefully illuminate is the significant level of uncertainty about autism, despite decades of intensive research across several domains. We undoubtedly know more than we did, but there remains much that is unknown and uncertain about what causes autism, how we can classify it and indeed what the significance of such a classification has in terms of clinical, educational and social practice. Again, this uncertainty about what autism is, what causes it, what its actual ”symptoms” are, is something that confronts teachers working with children with autism every day. The well known professional expression, ”If you’ve met one child with autism, then you’ve met one child with autism” expresses this concern about the huge variation in behaviours in those to whom the label of ASD is applied. Although on some levels teachers may often have strong desires for expert professionals to tell them what they should be doing with these children, the cognitive science itself is beset by uncertainty about the aetiology and expression of the syndrome.

3.5 Deficit or Difference?

My conceptualization of autism is to see it as being primarily neurobiological in aetiology. Now assigning aetiological primacy in this way does not preclude an understanding of the relevance of both sociological and psychoanalytic (i.e. emotional) perspectives on autism. It is important that we recognize that diagnostic categories, although related to underlying biology, are expressed and understood in a particular social context, and that this can have consequences, often deleterious, for the lives of people to whom those labels are applied. Sociological critiques also flag for us the possibility that for some people with autism, their differences could be considered as strengths and not deficits. For example, in a recent Nature article, Laurent Mottron (2011) reports on the successful employment within his lab of people with high functioning autism where particular features associated with autism such as attention to detail and the ability to identify patterns in distracting environments have been assets in employment. Personal reports by adults with autism of how they view their condition as giving them particular strengths, such as Grandin (2008), reflect a common stream of opinion from adults with autism that their neurology is different from “neurotypicals” but not essentially worse.

So is autism deficit or difference? One of the dangers of treating it just as difference, thereby overplaying the social model, is that it can lead to a failure to recognize suffering and to provide people who are suffering with assistance. Educational, social and financial exclusion tends to be the outcome for most people with autism as Howlin’s (2005) comprehensive review makes clear. Autism’s key impairments relate to social interaction and social communication and there are, inevitably, limits on how far it is practically possible to restructure society to fit the needs of people with autism. At its limits, the social model of disability tends to fail because taking its basic tenets to their logical conclusions inevitably ends up in real world absurdities. Autism, with its impairments in intersubjective experience, pushes difference right up in the face of society. Indeed, how far we should go in restructuring the external environment to meet the individual needs of people with autism as opposed to drawing them in to intersubjective relatedness is one of the key questions for those working with

these individuals in the caring services. As Hobson (1993) observes, social communication and social imagination are a “gift” and we should not assume that children with autism are forever shut off from these “gifts”.
From this perspective, it makes more sense to think about autism as a neurobiological disorder and to recognize that the impairments underlying it are real. However, at the same time as admitting this, it is also important to recognize the existence of alternative perspectives. In some circumstances, difference could be a strength, and it could also be an expression of personal agency. Temple Grandin and many other successful adults with autism strongly express the opinion that their autism is part of who they are and is not something they would want to have “cured”. However, how these alternative perspectives might apply to children and young people with autism who are struggling with the often massive impact of their impairments on their ability to function in the world is much more uncertain. It is these uncertainties, of course; the sharp end if you like of the academic and policy debates about inclusion and difference and deficit, which teachers working with children with autism have to deal with every day.

3.6 Psychoanalytic Accounts of Autism: Moving on from “Frozen Mother”

In the psychoanalytic tradition, as discussed by Alvarez (1992, p.185), there was a significant psychodynamicist trend of thought, mainly in the USA, which saw the aetiology of autism as psychogenic, that is it arose as a failure of maternal containment in early infancy, with the blame being laid on so called “refrigerator mothers”. This trend within psychoanalysis has now thankfully been rebutted to a significant extent, with a growing understanding of the place of constitutional factors in autism’s aetiology. Hobson (2011) suggests a rapprochement between developmental science and psychoanalysis, and characterizes the work of seminal psychoanalytic authors working with autism, including Tustin, Meltzer and Mahler, as recognizing that autistic traits can result from organic impairments. However, in my opinion there is nevertheless in their work an underlying emphasis on psychogenic factors which potentially

could have the unfortunate effect of deflecting attention from important findings from developmental science. For example, some case studies about the use of psychoanalytic technique with children with Asperger's Syndrome (Truckle, 2004; Stern, 2004) make considerable play of the emotional significance of atypical patterns of eye contact in the cases they describe. However, cognitive and neurocognitive research (for example Trepagnier et al., 2002) indicates that atypical patterns of face gazing predominant in people with an ASD diagnosis. Further, more recent research has indicated possible links between these patterns and neurological impairments in ASD (Dalton et al., 2005). Now such research does not discount the possibility of a) an interplay between emotions, emotional reactions and constitutional impairment in early development or b) the potential efficacy of a focus on emotions in working therapeutically with people with ASD. What it does do, however, is require those working and thinking psychoanalytically to stop and think about what the primary significance of atypical gaze (and potentially other behaviours of course) may be.

Alan Shuttleworth (1997) suggests that those working from a psychodynamic perspective with children and young people with autism need to pay more attention to bio-neurological factors about autism arising from cognitive, neuro and developmental psychology. Shuttleworth notes that clinical experience and insights from psychology strongly indicate that sometimes such children cannot actually make a choice. There is some fundamental deficit at a neurobiological level that means that there never is a choice for them. Shuttleworth describes such children as experience in themselves "unusual cognitive climates", which also tend to be produced in their interactions with others. Shuttleworth is not arguing that people with autism are either unable to engage in relationships nor able to exercise agency because based on his (extensive) clinical experience he a) considers such children to be in these states only some of the time, and b) based on Bion's influence, he recognises that the influence of containment, at the right time, can potentially lead to development and growth . What they can't do today, they may, at least in some cases, be able to do tomorrow, and, as Alvarez (op cit), this is particularly true for young people who are facing the inescapable developmental challenge of adolescence.

3.7 Bion's Influence

Bion, and in particular his concepts of maternal containment, projective identification as a normal form of communication and ”learning from experience” (see Section 4.3 for a detailed consideration), have had significant influence on the psychoanalytic thinking about autism. For example, Alvarez (1992, p.199), in thinking about how to work with children with autism, makes use of Bion's idea that thinking proceeds by way of a containing intersubjective emotional connection and the toleration of frustration. She suggests that children with autism may need a ”very specific kind of realization in experience”, a particular kind of enlivening interaction, if they are to overcome their innate lack of alertness.

Alvarez, along with Shuttleworth, explicitly responds to Bion's call is to place relationship and learning from the experience of relationship at the centre of therapeutic work.

It is worth noting that if this conceptualization of a therapeutic approach to working with autism holds true in the consulting room, it may also true in the classroom. Teachers working with adolescents with autism are indeed continually faced with making the very difficult delineation between times when they are really stuck in an unusual cognitive climate and times when they might be challenged to develop and grow. This is no doubt a considerable source of uncertainty for them.

3.8 Pedagogical Approaches to Working with ASD in Schools

3.8.1 TEACCH and modified TEACCH approaches

I have looked at issues around aetiology, cognitive theory and neurobiology. The picture that emerges seems to be rich in ideas, concepts and possibilities, but the considerable uncertainty in what we know at the present time about

autism would seem to imply an equal uncertainty about how we should go about working with young people and children with autism in clinical and educational settings. However, in education, there has been some very useful work done on attempting to integrate some of the key ideas from cognitive approaches to autism and, in particular, with the ongoing experience of teachers working with children with autism in the classroom. It is possible, therefore, despite the concerns of some adopting the sociological position, to talk about an autism pedagogy (or even pedagogical content knowledge in relation to autism) and although it is certainly far from uncontested, we can also at least discuss the idea of best practice approaches in autism pedagogy.

The most commonly used of these is the TEACCH approach (see Mesibov & Shea (2010) for an overview). This is provided as an integrated package including support and training by Division TEACCH at the University of North Carolina (UNC, n.d.). The central ideas in TEACCH can be summarized as:

- Improving skills by means of education and by modifying the environment to accommodate deficits.
- Parent collaboration: parents work with professionals as co-therapists for their children, so that techniques can be continued at home.
- Assessment for individualised treatment: unique educational programmes are designed for all individuals on the basis of regular assessments of abilities.
- Structured teaching: a focus on a structured educational environment rather than on free approaches.
- Skill enhancement: assessment identifies emerging skills and work then focuses upon these.
- Educational procedures are guided by theories of cognition and behaviour suggesting that difficult behaviour may result from underlying problems in perception and understanding.
- Generalist training: professionals in the TEACCH system are trained as generalists who understand the whole child, and do not specialise as psychologists, speech therapists etc.

(Adapted from Approaches to Autism, National Autistic Society, 2003)

It can be seen from this that TEACCH is based on a facilitative approach which is a) based on matching education to individual needs and b) although based on achieving behaviour change, is entirely non-compulsive. It has a strong emphasis on working in collaboration with the child's family and purports to be based on theories deriving from cognitive science. The most obvious connection is the strong focus on structure which is at least partially derived from the implications of impairment in executive function for organizational ability in relation to learning. TEACCH has been implemented as an integrated programme in many schools in the USA. However, in Europe and the UK it has been of influence, but implementation has occurred in a less standardized way. For example, in the overall HANDS project, the four special schools for children with autism participating in the wider study (from the UK, Hungary, Sweden and Denmark) all reported that they used TEACCH as an overall approach. However, detailed reviews of working practices at the schools indicated that they all used a locally modified version of TEACCH, and that they had a general commitment to its principles rather than a full implementation of the programme. For example, Randall school used such a modified approach which was defined in the school literature as follows:

3.8.1.1 Randall School's modified TEACCH approach

Structure

Structure can aid personal autonomy and independence by reducing dependence (e.g. prompting) on others. The environment and processes are modified to ensure each individual knows what is going to happen and what is expected of them. This can also aid the development of flexibility by reducing dependence on rigid routines. Structure plays to the strengths of a sense of order and preference for visual organisation commonly associated with the autism spectrum. Additionally, many people with autism may avoid new or potentially aversive experiences but through the medium of structure and positive, sensitive, supportive rehearsal can reduce their level of anxiety, learn to tolerate and accept such experiences and develop new horizons and skills.

Positive approaches and expectations

Wide ranging assessments of the strengths and individual needs of the person, their level of functioning and an assessment of the support they will need. We must seek to establish and reinforce self-confidence and self-esteem by building on natural strengths, interest and abilities.

Empathy

It is essential to see the world from the standpoint of the child or adult on the autism spectrum. This is a key ingredient in the 'craft' of working with children and adults with autism. We must begin from the position or perspective of the individual and gather insights about how they see and experience their world, knowing what it is that motivates or interests them but importantly what may also frighten, preoccupy or otherwise distress them.

Effective supporters will be endowed with the personal attributes of calmness, predictability and good humour, empathy and an analytical disposition.

Low arousal

The approaches and environment need to be calm and ordered in such a way so as to reduce anxiety and aid concentration. There should be as few distractions as possible. Some individuals may require additional time to process information, especially if this is auditory. They have additional sensory processing difficulties; they may need extra time to process information or we will need to pay attention to potentially aversive or distracting stimuli, for example noise levels, colour schemes, odours, lighting and clutter. Information is given with clarity in the medium best suited to the individual with care taken not to overload or bombard.

Again we see a similar strong focus on structure, facilitation and an individualized approach, but with additional attention paid to sensory processing.

It is interesting to note that no overtly technical references are made to cognitive science accounts of autism. Sensory processing is not, for example, linked to a weak coherence account of autism. Neither is there any reference to ToM or executive function, even in regard of its obvious links to the focus on structure.

3.8.2 Why no direct appeal to theory?

As has been summarized, the neuroscientific and cognitive accounts of autism, although taking us some way along the road of understanding the phenomenon of autism, are still characterized by a high degree of complexity and uncertainty. As with other areas of teacher knowledge and teacher practice, it is perhaps not surprising that programmes setting out guidelines for teachers eschew technical accounts and focus on more easily digestible descriptions of recommended strategies.

It is also possible to argue, after Schön, that inherent in such programmes is a recognition that teaching as a professional practice also relies significantly on the experiential knowledge that teachers and schools have about what does and does not work when working with children with autism in the classroom. In the example of Randall School, the programme guidelines seem both to reflect this underlying position and include some of this professional knowledge in the text. Following the idea of reflection in action, expert and tacit knowledge are seen as working in some way in tandem. The emphasis on what causes anxiety for the child, not something that there is much empathic attention to in the neuroscientific or cognitive literature, could be an example of this. This very point about the relevance of professional knowledge to the implementation of TEACCH was recognized by Mesibov and Shea (2010) in their review of evidence about the effectiveness of TEACCH.

3.9 Other pedagogical perspectives

Rita Jordan (Jordan 2005; Jordan and Powell 1995) has been perhaps the most influential European educational professional and researcher writing about pedagogic approaches to working with children with autism. She opposes those educationalists, such as Lewis and Norwich (2005), who are sceptical about special pedagogies for ASD, as well as recognizing that education for children with ASD also has a treatment aim, whose goal is to reduce the core difficulties caused by the syndrome. In adopting this approach Jordan implicitly places as much emphasis on changing the child to fit their environment, as on modifying the environment to fit the child.

Teaching social strategies

Jordan is forceful in promoting the explicit teaching of social strategies, and the use of "errorless learning" or over learning, despite concerns (see Györi 2006) expressed in the literature about transferability of discretely taught skills from one context to another. It is also relevant to note here the prevalence of the use of social stories (Gray 2007; Rust and Smith 2006); visually based sequential stories that are specifically designed to develop skills related to social interaction and emotional management by many teachers working with children with autism.

Visual Learning

She also recommends a focus on visual learning, something also stressed in TEACCH. In this context, it is interesting to note that although there is little dispute about the preference for children and young people with autism for visually presented information, and the use of visual support cues in helping with daily organization, it is relatively unclear as to how this trait relates to underlying cognitive models of autism. Arthur-Kelly et al. (2009) review the use of visual supports such as pictorial daily timetables to support children with autism in schools with transitions, and systems such as PECS (Picture Exchange Communication System; Bondy and Frost 1994) which are used to augment communication. They suggest that it may be the transient nature of human verbal exchanges that leads to a preference for visual channels. Thus,

difficulties with semantic and pragmatic language linked to ToM impairment, as well as processing speed issues related to executive function, may make language based communication more difficult. In contrast, visual stimuli, which are more permanent, may have a more tangible effect in triggering memory and links between concepts and actions.

Language

Jordan (2005) stresses the importance of teachers understanding difficulties in receptive as well as expressive language in autism. The links to cognitive accounts, in particular ToM, are particularly clear here, and deficits in receptive language may lead to a failure to understand the communicative intent of much teacher language in the classroom and teachers are at risk of interpreting lack of response as obstinacy or behaviour-related. Jordan notes that children with autism may ask questions in order to hear the answer they expect, and be surprised when the teacher says they won't tell them because they know the answer already. She also notes that children with autism may follow instructions to the letter, and may find it difficult to understand sarcasm. So if they are told, after dropping something, "Well done" in a sarcastic tone, they may interpret this as actual praise. They can also have problems in interpreting different registers, and for example may respond to a question, "Would you like to come and join the line for lunch" with "No Thanks", communicating honestly but leading to the teacher misinterpreting the response as cheek.

Jordan (2005) stresses the need for clear, unambiguous instructions and considered use of language, as well as fostering a climate of language acceptance by peers, particularly when these are children not diagnosed with autism.

It is possible, therefore, to talk about a broadly accepted autism pedagogy, which has indirect links to the body of (uncertain) cognitive science knowledge about autism.

3.10 Thinking about Adolescence

3.10.1 Adolescence

The children in the study are aged between12 and 18. As such, it is relevant to consider how their developmental stage, that of adolescence, may relate to how their teachers think about them.

Adolescence is a time of change and crisis. Although perhaps somewhat ignored in Freudian and early Kleinian theory (Blos 1998), there has been increasing interest within psychoanalysis in the phenomenon of adolescence, and its crucial role in the development of stable adult personality structures. Waddell (1998, p.139) gives a broad outline of the psychoanalytic view of the adolescent crisis. The onset of puberty, with its attendant physiological changes, serves to push the child out of latency. Anxieties about what they might do to the mother and father, originally experienced in the oedipal stage, are now revisited with the added awareness that with the onset of puberty, what was originally certainly phantasy could now happen in reality. The reworking of the oedipal constellation, or to put it another way, the move from attachment to the parents to the achievement of new emotional and sexual attachments outside of the family, is the central work of the adolescent crisis. The imperative of this move, in conjunction with pubertal developmental changes, presents an enormous challenge to the existing personality structure. Whether the child is able to think about these challenges, and how well they can cope with them is likely, according to Waddell and Blos, to be dependent to a significant degree to the quality of containment of the original infantile impulses and feelings and the concomitant degree of personality stability achieved in latency. As well, of course, it will also depend on the quality of the external environment, and in particular how well key adults, who are also of course challenged by the adolescent crisis, manage to serve in a containing function for the child. Responses to the adolescent crisis frequently include projection and the enactment of internal tensions and anxieties, as opposed to dealing with the enormous anxiety that might be entailed in thinking them through. Acting out

may also be a way of testing external authority, be it parents and those felt to represent them, such as teachers. Waddell suggests that this may also be an unconscious testing of internal parental figures, where unconscious anxiety about the child's destructiveness and the potentially harsh response of internal figures may be projected onto external figures.

Projective mechanisms and splitting often lead to group identifications. The working through of adolescence, although unavoidably painful, does, when pathology is avoided, lead, if projective processes are not too harsh, to a process of gradual re-introjection, where the parts that were initially disowned can start to be explored. If guilt over rejection of the parental figures can be accepted, then a flexible reorganization of attachments can lead to a time of exploration, flexibility, and creativity, which ultimately culminates in the development of a stable adult personality structure. The challenge for parents and teachers in working with adolescents is a difficult one, and involves treading a tightrope between maintaining safe and secure boundaries whilst at the same time fostering an environment where exploration, experimentation and growing independence can also find a place. The ability to resist the significant projective processes associated with adolescence is also very important.

Bollas (1992, Chapter 11, p. 247) in his consideration of adolescence, places more of an emphasis on flexibility and creativity. He identifies generational markers which serve as tentative transformational objects for adolescents of each generation. Transformations that originally take place when the mother's processing of the infant's projections results in a developing experience of the self become even more important during adolescence, when the need for projections to be processed is just as acute. The ability to test out different modes of "deploying your idiom in the object world" at a time when working out that idiom is very much associated with anxiety, makes generational idioms very attractive. Instead of having to launch yourself, exposed, into one particular idiom, there is potentially a great degree of reassurance in being able to test out different idioms that are held, generationally, in terms of fashion, music, arts and language. Concomitantly the inherent flexibility of the adolescent structure also means that this is potentially a time of great exploration and

experimentation, when different idioms can be explored, tested out, discarded, taken on again, and in some cases integrated in to the developing adult personality.

3.10.2 Adolescence and Mobile Smartphone Technology

Most young people are competent and confident with using mobile phones. The Mobile Life Youth Report (YouGov 2006) found that 91% of 12 year-olds in the UK have a mobile phone. Although this study has not been repeated recently outside of commercial research agencies, it is likely that these figures have increased. A report by Nielsen, as reported in Marketing Week (Owen 2011) in January 2011 indicated that 36% of UK teenagers had a smartphone, although again this is likely to have increased since then. At the time of the study (2009/10 academic year), smartphone use was more extensive across the population in general than amongst teenagers. The HTC Touch smartphone that the HANDS software was installed on represented the beginning of the curve of the smartphone revolution. The iPhone only launched in 2007, and with Android still on the horizon there was no clearly identified alternative platforms. Further, smartphone handset and contract costs were still prohibitive for many teenagers. The upshot was that in 2009/10 any type of smartphone was still aspirational for many adolescents, which suggests that in all likelihood their desirability was even higher than it is now. We could view mobile smartphone technology, particularly for teenagers in the first decade of the 21st century, as a very likely choice for a generational object. Potential identifications relate to: associations with communication and involvement in the group - via texting and nascent social networking; significant scope for personalization – ring tones, individual phone covers; links to music and celebrity culture via YouTube for example; and its association, at least in 2009/10 with the promise and enticements of adult life.

These identifications were likely to mean that a modern smartphone was an object of generation specific desire. It is of course reasonable to question to what extent such desires were experienced by adolescents with autism.

However, as the data presented will show, in many cases the children at the school did experience such desires and identifications in relation to the HANDS smartphones. As such, its introduction potentially stimulated or reignited uncertainty amongst the teachers about to what extent the children they were working with were “normal teenagers” as well as anxieties about how they would function as autonomous agents in the wider social world both during their time at school and in the future.

3.10.3 Adolescence and Autism

Howlin (2005) in his review of outcome studies, identifies that having ASD leads to a very high risk of marginalisation and social exclusion, with adolescence and early adulthood being especially critical periods for individuals with ASD.

Mesibov and Shea (2005) consider that in adolescence and early adulthood they have highly decreased chances of managing an independent life, succeeding in education, establishing long term interpersonal relationships and finding adequate jobs (or jobs at all).

It seems reasonable to suggest that the impairments associated with ASD, particularly in terms of social interaction and social communication, present a huge stumbling block to the resolution of the adolescent crisis. When you are unable to think at all about how to go about forming a relationship with a girl, when you know that you very much remain tied and dependent on the support of your parents and teachers if you are to function in the world at all, let alone become an independent adult, then the adolescent crisis seems to take on much more significant ramifications. We know that the sense of failure associated with the adolescent crisis can easily lead to depression. Indeed, the incidence of depression and suicide in teenagers with ASD is very high (Howlin, op cit). In the wider HANDS project, a teenager at the Danish school working with HANDS sadly committed suicide in 2010.

However, a significant number of teenagers with ASD do more or less successfully negotiate the adolescent crisis, and the other challenges associated with their diagnosis.

As Alvarez (1992) suggests, in some cases the crisis itself may present an opportunity to escape from established rigid patterns and to reach out to new ways of relating.

Particularly for those towards the edge of the spectrum, including many with Asperger's Syndrome and High Functioning Autism, the possibility is there for achieving a significant degree of independence, and forming relationships and having children.

For teachers working with adolescents with autism, these issues must surely be ever present. In particular, the tension between promoting independence and autonomy and recognizing the limitations that the diagnosis may imply must be a source of considerable anxiety and ongoing uncertainty for teachers working with these children.

4. Methodological Considerations

4.1 The Realist Perspective

4.1.1 The Essentialist/Realist vs. Constructionist Debate

A pertinent and perennial question in the Social Sciences and associated disciplines is that of how we can devise valid methods of inquiry, and this question inevitably has as a backdrop a consideration of the perceived validity of methods of inquiry in the traditional sciences, which further mirrors the debate between realist and constructionist views of experience. Thus qualitative research methods can be considered as essentialist/realist or constructionist (Braun & Clarke 2006). Essentialist/realist methods aim to report the meanings, experiences and reality of the participants, and in my understanding this means that they are predicated on the idea that the participants act as autonomous cognitive subjects which have some access to or purchase on an independent reality. Alternatively, constructionist approaches examine the experiences of participants from the viewpoint that the meaning, experiences and reality reported and observed are influenced by a range of discourses operating within society. In my understanding this means that such approaches are predicated on the idea that the participants, at least to a significant if not exclusive extent, are not acting wholly autonomously, and that either their experience and interpretation of reality or indeed the way in which they come to be experiencing subjects in the first place is dependent on external factors.

4.1.2 Towards a Realist Position

The methodology and design which an individual researcher chooses for a project and their overall positioning in terms of interpreting and understanding

the research projects of others is, within the Social Sciences, thought to be linked to the position that they take up within the spectrum of ideas represented by this debate. Where, then, do I position myself ? The key issue for me is that of agency. This is an issue for both positivist and constructionist approaches, in that both are at risk to some extent of falling in to the trap of determinism – positivism through mechanistic explanations of life and consciousness, and constructionism through mechanistic explanations of society and its influences on the individual.

With a constructionist approach, in particular, if we take that to mean that social or historical forces play an intrinsic role in the construction of the subject or the subject's experience of reality, then the issue of agency and potential change needs to be resolved. Again, my thinking in this area has been influenced by my religious values, and my view of human beings as beings with agency. This is not, of course, purely a religious position, as Kant's Critique of Pure Reason demonstrates. Magee's (2000) clarification of Kant's position in the Critique is as follows. Kant resolves Hume's demolition of the possibility of independent verification of causation by proposing the existence of synthetic a priori types of knowledge, which he postulates as time, space and causation. These are things which our sensory and experiential apparatus impose on our experience – they are part and parcel of our experience of the world. This means that causation is an aspect of our experience in the phenomenal world (i.e. the things that we experience based on our sensory and experiential apparatus). Thus, according to Kant, although there very much is a reality that is independent of our experience of it (the noumenal world or "things as they are in themselves"), we can by definition have no access to that noumenal world nor can we logically talk about there being a causal link between the noumenal and phenomenal world.

If we can have no access to the noumenal world, as Magee points out, it is reasonable to consider whether we do have adequate grounds for believing that it exists at all. As Magee discusses, several philosophers following on from Kant, including Hegel, have taken a stricter idealist position, considering that experience equals reality and is synthesized by minds or some sort of general

Mind. Within the phenomenal world, however, because in a sense by definition it is based on the synthetic a priori postulates of time, space and causation, the physical laws of science very much apply in that world and thus the scientific method is a true path to knowledge about the phenomenal world. Kant saw structure and organization as overarching principles in the world. This also led him to consider the question of determinism, which is clearly an issue for empiricists (i.e. those who do believe that there is an independent reality that we as humans do have mediated access to). Magee again sets out Kant's position here, which is based on the idea of agency. If we accept the existence of agency, which in my view surely all right thinking individuals must do and indeed by their actions show their on-going belief in, then this means that there must be something outside of the empirical world that allows for free decisions.

These free decisions, if they are free, cannot be part of the empirical world and its laws, as this would mean that they are determined and not free, thus they must inhabit some separate realm outside of the governance of scientific laws. They must inhabit a transcendental (i.e. noumenal) realm. Although Kant interpreted this as the soul, this approach does not necessarily entail a religious approach and indeed many non-religious thinkers and philosophers, including Magee, have taken a non-religious stance of transcendental idealism based on Kant's position. According to Kant, however, another correlate of the fact that this agency in some way inhabits the noumenal realm is that we can have no direct access to it. Even with the advances in neurology and development psychology in the last hundred years, it is still the case, as Magee points out, that if we try to introspect on matters of will or thought – i.e. in the instant how did my decision to act arise or in the instant where did my thought come from – we have no purchase on this, we encounter "no explanation, no causal connection with anything else, a void" (Magee 1998, p.196). Again, although this is in no way an explicitly religious consideration, it does resonate with religious thinking. For example, in Jewish Chassidic and Kabbalistic thought, we find the idea of "chochmah" set out by Rabbi Shnuer Zalman of Liadi, one of the early Chassidic thinkers in the 18th century. Steinsaltz (2003) interprets this as the creative flash at the base of all human thought which is linked in an unknowable way to the divine. As I will explore, in Bion's later epistemological

developments, as well as in other twentieth century philosophical accounts of how we relate intersubjectively with a human other, this creative flash, or insight in the noumenal, can be seen as playing a role in the move from not knowing to knowing. This has particular significance in providing an account of what happens when professionals in the caring services engage with uncertainty and problems involving the human other.

4.1.2.1 Evolutionary/Developmental Accounts of Agency

Authors such as Aitken & Trevarthen (1997), Fonagy & Target (2007), and Neisser (1993), propose a view of the mind which rejects both the tenets and implications of the Cartesian position. Their view is based on a psychology influenced by socio-cultural theory derived from Vygotsky and Soviet psychology. This psychology sees the mind not as something independent, approaching the social from a cognitive perspective, but rather as something that in essence arises from or is created from the social. In Vygotskian terms, the intrapersonal mind can only be conceived as coming into being when a person encounters the social interpersonal, and in particular when they encounter language.

The socio-cultural/interpersonal turn within psychology, exemplified in the writings of Trevarthen, Fonagy and Neisser, is strengthened by its reference to evidence from developmental psychology, neuroscience and evolutionary psychology. Neisser uses the term “the interpersonal self” to refer to the development of a perceived self-based on patterns of reciprocated, instantly graspable communicate behaviours between people. In common with Neisser, both Trevarthen and Fonagy see such communications as instantly graspable because they are instinctual patterns which have an evolutionary origin. They also rely on a very significant body of work on the neurological and behavioural study of developing infants. This research provides strong evidence to support two contentions, firstly that from birth (as well as before) human infants have the ability to engage in mutual relational communication with other humans and that this communication forms the bedrock of the development of the mind and the personality; and secondly that the development of the brain is intertwined with

and dependent on the presence of such relational communication with adult caregivers.

As Cilliers and DeVilliers (2000) point out, such developmental/evolutionary accounts point towards another way of escaping from the determinist trap set out by Kant based on the idea of emergent complexity. In this account, the agentic self and consciousness is something that arises when the brain reaches a certain level of complexity, although as an emergent property it is not reducible to its simpler constituent parts.

4.1.3 Counterpoints to Realism

Theorists working from a constructionist, feminist position, have, of course, presented strong counter arguments to the realist perspective based on an idea of individual agency. Hollway (1988), in a very well argued account, shows how many “common sense” psychological ideas, such as that of the developing child and the framework of biologized capacities, are in fact produced concepts that need to be understood in relation to their historical formation. She bases her interpretation on a modified, less overly determined understanding of Foucault’s consideration of the interplay between knowledge and power (see Smart, 1985). In a similar vein, Henriques et al. (1988) further explore the split between the view of the world based on society and on the individual. They regard this split (which of course echoes the essentialist/constructionist split referred to above) as essentially flawed and as representing in fact a dualism, i.e. approaches based on society see the individual as a vacant space and fall prey to determinism and approaches based on the individual fail to take account of the historical and social processes of production of concepts, leading to a false emphasis on a rational, biologically determined individual subject. This approach is very close to the socio-cultural position, where the distinction between process and product (or thought and action) is dissolved. However, it is relevant to note that Henriques et al. (ibid) also criticize such socially-orientated accounts of cognition, which rely on a mechanism of internalization to account for the link between society and the individual. They argue that in both Mead’s and Vygotsky’s account the space inside posited by a process of

internalization is left untheorized, and this inevitably leads to the “homunculus” idea, i.e. a rational cognitive subject there at the centre. This means, in the terms of their account, that the characteristics of individual development are taken to the fore and crucially that the content of what gets internalized is overlooked.

Following Kant, my position is that I don’t see how you can ever eradicate the homunculus in some form – an inescapable consequence of Kant’s Critique of Pure Reason is that the unknowable flash of creativity/cognition at the base of thought is a part of what humans are. Further, I contend that in thinking more about the “flash” and particularly how it is positioned in intersubjective accounts or relating to the human other that we can make progress in understanding how professionals in the caring services deal with uncertainty.

4.1.4 The Realist Position

Realism is often considered as an intermediate position between essentialist and constructionist positions. Woods (1996) describes how symbolic interactionism is a typical expression of the realist position – there is a reality independent of ourselves as observers, but intersubjectivity is still possible – i.e. it is possible for me as an outsider and as a cognizing agent to get a “purchase” on the external reality of another individual, even though this reality is to some extent “constructed” by the actors. Thus I side with Hammersley (1992), in arguing for a realist conceptualization of interpretivist research, where there is some possibility, even if in a limited way, of discovering some essential truths about the experience of the subjects independently of the position of the researcher.

Thus in the realist position, although the influence of social forces is not denied, they do not overwhelm the existence of the actor as an independent agent who to some extent constructs reality for themselves.

4.1.5 Interpretivist Approaches vs. Psychological Approaches in Educational Research

Gage (2007) gives an account of the “paradigm wars” in educational research, which he views as taking place from the 1960s onwards. Psychology, from the 1920s onwards was the first discipline to turn its lens on education and teaching. Educational research located in a positivist psychology paradigm flourished in the 1960s and 1970s, but in the 1980s came under severe criticism from other disciplines. In particular, the anti-naturalist/interpretivist critique proposed that human affairs are not amenable to study with the scientific methods used to study the natural world. This is because human affairs (such as education) are inextricably involved with the “intentions, goals and purposes that give meaning to life” (Gage ibid, p.152). Thus there is no clearly discernible, direct link between a particular teacher behaviour or particular educational innovation and student learning. Rather, in the complex field of education, with its multiple actors, and multiple, fast moving interactions, specific interventions or changes must be adopted by the actors, and re-interpreted by them in terms of their intentions and goals. As such, they cannot usefully be considered equivalent to the isolated, independent variables of scientific research. Interpretivist researchers, accordingly, emphasize the phenomological (c.f. ethnography) perspective of the actors. Crucially, people’s individual interpretation of their world affects their actions, creating the possibility that people faced with the same or similar situations will produce different reactions. Furthermore, it could be individual factors that affect actions such as personality, motivation, or social factors such as compliance or prejudice. Thus in opposition to a naïve positivist focus on behaviours only, the interpretivist critique proposes “behaviour+meaning” as the unit of study when researching human affairs.

The anti-naturalist/interpretivist critique has had a huge impact on educational research and from the 1990s onwards the balance in active educational

research shifted away from psychology (aptitude tests, achievement interventions, use of statistics) towards ethnographic studies.

4.1.6 Evidence in the Realist Position

If the naturalist/interpretivist critique is correct, if everything is so complex, then this raises the question of what can we know? This is indeed one aspect of the extensive debate over what counts as evidence in the Social Sciences. Particularly in more idealist approaches, such as social constructionism, it is often difficult to see on what basis claims for knowledge can be made. This debate is highly significant for decisions about data collection methods and the analysis of data. For example, in many strands of psychology, interviewing is thought of as a neutral method for gathering data, “a conversation with a purpose” (Lincoln and Guba 1985, p.268), ‘neutral’ in the sense that any sensitive interviewer asking the same question of interviewee X will receive the same response. Similarly, the analysis of interview (and observation) data is, perhaps rather less often, thought to be straightforward in that meanings can be gleaned from interviewee responses and categorised in a manner that can be replicated by another (Strauss and Corbin 1998).

Mishler (1991), amongst many others, questions the neutrality of the interview by indicating that what a question means to the interviewer may well not be the same as for the interviewee. Furthermore, “Changing the interviewer changes the interview results, even if the new interviewer asks the same set of questions” (Scheurich 1997, p.67). Consider for example a female child being interviewed, with the same set of questions, by her teacher, or an unknown, male adult researcher, or a female adult researcher, or a female relative, or another child. We would expect the responses to differ in each case. In order to analyse interview transcripts the nuances, ambiguities and uncertainties need to be simplified to enable data reduction and categorisation (Ryan 1989). This is not to say that interviews are un-analysable and unreliable. Researchers have the audiotapes or the videotapes, as well as field notes, and impressions.

Nevertheless, in interpretivist research, there is a general recognition of the contingent nature of the whole interview (and observation) process and hence the kinds of responses elicited and the theory-driven nature of ascribing meaning to the interviewee's utterances. The researcher's account, therefore, will be a narrative of its own and calls for reflexivity and openness by the writer and multiple elements to be presented by the researcher. In sociological approaches influenced by feminism and post-modernism, the background of the researcher is in fact seen as inescapable, and the research findings inevitably constituting a production based on the interplay between the researcher's perspective and those of the subjects (Lather 2007; Scheurich, 1997). However, a realist conceptualization of interpretivist research maintains that there is some possibility, even when recognising the contingent nature of the data, of discovering some essential truths about the experience of the subjects independently of the position of the researcher. Further, there is established good practice in interpretivist research (Strauss and Corbin, op cit), which suggests steps that can and should be taken to promote the "credibility" of the data, and where possible to make explicit the particular factors about the interviewer and interviewer-interviewee relationship that may have a bearing on the type and quality of the responses elicited. Thus Cohen, Manion and Morrison (2007) suggest that to be credible a piece of research should be factual (i.e. Not made up, selective or distorted) and should have some measure of interpretive validity, i.e. it should to some extent catch the meaning of the events being observed for the participants/subjects themselves.

4.1.7 Towards a Meeting of the Minds

In the last 15 years there has been a further shift in the paradigm wars from conflict to collaboration. A significant body of opinion (Burke-Johnson and Onwuegbuzie 2004; Orlikowski and Baroudi 1991;Gage 2007;Chatterji 2006) argues that it is possible to have a level of complementarity between different theoretical approaches. It can be argued that a) they are all underpinned by the same moral and ethical objectives to improve the educational experience and life chances of children and b) could more sensibly be regarded as being

concerned with different problems or different aspects of problems. The HANDS project in a way exemplified this shift in thinking. Researchers coming from two quite different paradigms – cognitive psychology and interpretivist educational research, worked closely together on a joint project. Over time, they came more and more to recognise that both perspectives had something to offer. Cognitive psychology evaluations were seen as focusing on a defined process-product relationship, allowing the detection of group level effects derived from the introduction of the HANDS innovation. Contrastingly, the ethnographic case study approach focused on the "behaviour+meaning" unit, considering how individual differences, individual perspectives and larger socio-cultural factors can determine the outcome of the introduction of innovation for individual teachers and individual children. We ended up with a joint position that a complementary paradigm approach allows for evaluation of the innovation on different levels, leading to the development of a richer understanding. As Gage (op cit) indicates, many educational research studies since 1990 have used both objective-quantitative and interpretive-qualitative methods, and the HANDS project found itself, perhaps more by accident than design, in this tradition.

It is important to note that the PhD sub-project reported on here very clearly adopted an qualitative interpretivist approach. However, the experience of working closely with a cognitive psychology team over time did have a significant influence on my methodological positioning, on the adoption of particular methods, and on the approach to data analysis. For example, the professional interaction raised issues of validity in respect of the sole use of observational notes in the modified infant observation data collection method, which led to the additional use of voice recording.

Further, it also influenced my position in relation to the weight to be attached to cognitive psychology and cognitive neuroscience. Certainly, I continued to be aware of, and to accept, the importance of sociological critiques of psychology in highlighting the potentially contingent nature of quantitative techniques in the Human Sciences. In common with some modern cognitive and developmental psychologists (see Boyle 2002; Burman 2008), I understand the need to treat psychological categories and the process of categorisation, not as something

given in tablets of stone from on high, but rather as useful, but contingent constructs that can help us make sense of the world. However, my involvement with the use of cognitive psychology in the HANDS project has made me much more aware of how these constructs, even with their contingent limitations, can usefully facilitate the use of categories and comparisons to sensibly make sense of many aspects of human life, including the measurement of the effectiveness of interventions.

4.2 Psychoanalysis and Sociological Research

4.2.1 Psychoanalysis as Science?

As Grotstein (2007) contends, Freud saw psychoanalysis as a science. His conceptualisation was largely positivist. He believed he had, based on his experiences in the consulting room, been able to derive testable hypotheses about the inner drives of individuals that could be generalized to the whole population, and that further clinical work by himself and others would provide evidence to support these hypotheses and thus give them the status of facts. Although few in the last forty years would be as empirically gung-ho about psychoanalysis's status as science, it is still seen by many in the psychoanalytic community as a way of objectively establishing something about the emotional life of an individual . Thus Edna O'Shaughnessy (1994) attempts to write about the existence of "clinical facts" in the consulting room encounter. She defines a fact (including clinical ones) as "a truth claim which is not infallible or unique to the fact, and also a claim that must offer itself for verification" (p.939). Although her discussions appropriately reflect the epistemological complexities, she essentially proposes that the knowledge that is gained in the clinical encounter based on an understanding of dynamic unconscious processes such as transference and counter-transference, can be communicated in an understandable form to others who understand these terms and that what she has learned from one patient can be tested out in the context of other patients with other therapists.

Others, of course, have rejected this attempted classification of psychoanalysis, and have typified psychoanalysis more as hermeneutic exploration than science. Frosh (1997) markedly points out that whereas in the classical scientific method, the observer aims to be as independent as possible from the events under observation (significantly so that someone else acting as an observer could validly replicate the observation), in the therapeutic psychoanalytic encounter, the therapist is completely involved in the encounter. Further, the clinical facts that therapists make use of are often reflections on their own emotional state, and as such are inherently resistant to independent observation or verification. It seems to require a huge leap of imagination to classify the later reflections of a therapist on their emotions in such an encounter along with the work of say a medical scientist working on measuring differential growth of cell cultures in response to two different drugs.

4.2.2 Psychoanalysis and Sociology: Overlaps in Emotional Life

If psychoanalysis is not, then, at least in a straightforward sense, a physical science, how then does it relate to sociology? There are strands within interpretivist research which can be viewed as being much closer to psychoanalysis. Rustin (2006) has suggested that the process of infant observation (see Miller et al. 1997) has a number of parallels with ethnographic approaches, particularly those based on symbolic interactionism, which focus on the emotional experience of those participating in the study as observer and subjects. Wood's (1996) description of how symbolic interactionism is based on the experience of self from two viewpoints – that of "I" and "Me" has some (perhaps obvious) echoes of Freud's structural model of id, ego and super-ego, with the "I" corresponding to the ego and the "Me" sharing some features with the super-ego. Of course, what is clearly missing in the analogy, is the id, which is absent from the symbolic interactionist account, which is explicit in holding mental processes about the self to be conscious.

As, in the symbolic interactionist position, individuals construct meaning for themselves, this implies that the researcher has to some extent to “uncover” the meaning of symbols for the subjects in the study. The researcher cannot assume that the meaning that they attach to a symbol is the same as that attached by the subjects. Thus a researcher in the symbolic interactionist tradition is interested in gaining “thick” descriptions of the meaning of things as they are constructed by subjects. Some interpretivist researchers such as Woods have considered that the emotional life of the subject will be a significant part of the “thick description” that uncovers the meaning of symbols for the subjects, and additionally that the way in which the researcher understands such meanings will inevitably be mediated by their own emotional history.
For example, Woods considers a case study of a school undergoing a public inspection. One of the researchers writes a reflective journal about his observations of the experiences of staff during these inspections, in which the researcher focuses on their emotional experiences, as well as on how his life experiences have, in his perception, allowed him to be more attuned to their experiences, as in this extract:

> “It might be the case that my strong connection to these teachers is an empathetic one based on my own history. I failed the eleven plus, taught in the same area for twenty years…..and I am of the same educational generation as many of them” Woods (ibid, p.104)

Woods, commenting on the journal entries presented, points out that in more “scientifically orientated” strands within sociology, such a focus by the researcher on their own background and emotions would be regarded as unwarranted interference in the research process. As Woods points out, in sociological approaches influenced by feminism and post-modernism, the background of the researcher is seen as inescapable, and the research findings inevitably constitute a production based on the interplay between the researcher’s perspective and those of the subjects. Yet Woods, as does Hammersley, ultimately holds out for a more realist conceptualization of interpretivist research, where there is some possibility, even if in a limited way, of discovering some essential truths about the experience of the subjects

independently of the position of the researcher. The focus on emotions rather is then for Woods an additional tool that can be used as part of the "discovery process". Woods even extends this to reflection on emotions outside of the research setting. Thus Woods reports the researcher reflecting in his journal on his feelings, whilst going to the ballet, after a day of observation during the inspection:

> "As I enjoyed the invigorating and joyous music...with its party atmosphere, I began to feel quite close to the Tafflon teachers and felt angry that they were not part of this very jolly and uplifting environment" (ibid, p.98)

Woods, analysing the journal, suggests that the researcher's emotional reaction during the ballet indicates an empathy with the teachers – that is his continued thinking about the school in his leisure time mirrors the experiences reported to him by the teachers of being unable to switch off from the ever present inspection presence. For Woods, this increased attunement means that the researcher is better able to pick up on these aspects of the teachers' experience and thus better able to interpret the meaning of symbols for them.

Such an emotion-orientated interpretivist approach does have a number of striking parallels with infant observation. Indeed, Hinshelwood and Skogstad (2000) specifically compare the use of psychoanalytic observation to naturalistic research practice in field work in sociology and anthropology. What is less clear is how the consideration of the unconscious is to be incorporated into such a "marriage" of approaches. The authors were working as researchers, using institutional observation, which was informed by aspects of infant observation as well as by organizational consultancy.

Thus when Hinshelwood and Skogstad consider the "research" methods used by the therapist in a clinical setting, viewing the therapist as a participant-observer, they list these faculties:

- Observes with evenly hovering attention

- Employs their subjective experience, filtered by personal analysis
- Capacity to think and reflect about experience as a whole
- Recognizes unconscious dimension
- Applies interventions to verify their interpretations of events

(Hinshelwood and Skogstad, ibid, p.17)

The authors suggests that all but the last point can be applied to psychoanalytic research in a non-clinical setting and specifies this approach as similar, yet the glaring mis-match is with “recognizing the unconscious dimension”. One approach would be to treat it as a development or an extension of Wood’s focus on emotional life. Indeed, the ballet episode discussed above seems to come very close to a consideration of counter-transference. Although many interpretations of Mead see him as focusing on the conscious mind, such an extension could be considered as viewing an understanding of dynamic unconscious processes as another “tool” to be used in the discovery of symbolic meanings – i.e. the counter-transference is a way of the researcher picking up on hidden meanings.

4.2.3 Towards psycho-social research

Can techniques then from infant observation be applied in social research? There is considerable debate on this point. One could, as Alan Shuttleworth (1997) suggests when considering the whole psychoanalytic enterprise, posit that psychoanalysis is in one sense a very modernist approach to understanding people. It is rooted in Freud’s idea that we can use the albeit esoteric tools of psychoanalysis in a scientific way to come to an understanding of why people do things. One could view this modernism, perhaps inherent in psychoanalysis, as being in significant contention with more post-modernist influences in sociology and the interpretivist tradition, which see knowledge and understanding of others as being situationally constructed and understood. A common critique of psychoanalytic methods (see for example Frosh 1989) is that they tend to be too focused on individual relationships and ignore the

influence of structural and historical factors such as race, gender and class. Although it should be noted that theorists such as Walkerdine, Lucey and Melody(2001) and Reay & Lucey (2010) have attempted to assimilate feminist and psychoanalytic approaches.

Perhaps the most striking difference between such an approach and traditional realist interpretivist research is that it assumes that both the subject can be wholly unaware of the influence of their unconscious processes on their behaviour at any given time and that the researcher can potentially access these processes in counter transference. As Frosh (1989) points out, when psychoanalytically orientated researchers talk about understanding their subjects in this way it means something very different from what many sociologists would mean by the same phrase. In this vein, Frosh and Baraitser (2008), in a special edition on psycho-social research methods in the Journal *Psychoanalysis, Culture and Society*, strongly criticize the validity of the use of transference/counter-transference outside of the consulting room context, although their critique is perhaps based more on their disagreement with what they characterize as normalizing and mechanistic Kleinian approaches in the psycho-social mix, expressing, in line with the Walkerdine et al. (op cit) and Reay and Lucey (op cit), a preference for a “reflexive approach” based on Lacan, where what is useful and relevant is what is constructed between researcher and researched. In contrast, other authors point towards the possibility of a realist position in both psychoanalysis and sociology. As Jefferson (2008) points out in the same edition, in the real world of both the consulting room and the research field, there is considerable utility in holding on to the idea of an “inside” and an “outside”, whilst admitting their reflexive influence on each other, and they see the use of transference/counter-transference outside the consulting room as both legitimate and potentially illuminating.

4.2.4 A Psycho-social approach

Overall, then my approach to investigating the research questions in this study is based on a realist interpretivist approach combined with recognition of use of psychoanalysis as an investigative tool in uncovering the role of the dynamic unconscious in the working lives of subjects in the study. Thus this study can be considered as employing a psycho-social interpretivist approach.

4.3 A Psychodynamic Approach – Bion and Uncertainty

4.3.1 Bion's epistemology

Understanding Bion's ideas is difficult and his writing, although sublime in its formulation and ambition, cries out for interpretation. As well as reading a number of key Bion books and papers directly, fermenting my understanding of them over a period of a number of years, I have also made use of several commentaries on Bion's work by Bion scholars, particularly Symington and Symingtom (1996), Bleandonu (1999) and Grotstein (2007). However, a full treatment of Bion's dazzling array of ideas still remains very much outside the scope of this study.

4.3.1.1 Learning from Experience

Bion (1962) developed a system of epistemology based on Kleinian ideas, proposing that the process of coming to know depends on the development of the ability to tolerate the frustration of uncertainty – of "not knowing". In "Learning from Experience" (Bion, ibid), as interpreted by Symington (1996), he proposes that it is the growing toleration of frustration signified by the development of the depressive position that allows "thinking" to develop. Thinking and/or thoughts are what happens in the space where the infant can tolerate the non-appearance of the breast or other part-object, as opposed to evacuating it in Paranoid-Schizoid mode. For Bion, the process of thinking and

learning is rooted in the developing ability of humans to tolerate uncertainty and "unknowing". Relationship is at the centre of Bion's epistemology. Normal projective identification from the baby to the mother, which the mother recognizes and can process with her reverie is the central aspect of knowing someone else (the K link).The baby, for example, has a pre-conception of the mother's breast. The exact meaning of "pre-conception" is somewhat unclear. My initial reading of "Learning from Experience" suggests to me that it means something like an instinct in its first instantiation. Grotstein (op cit, p.87), however, formulates it as something closer to the Kantian noumena or "thing in itself". When the breast is absent, so that this pre-conception cannot be realized, the baby feels that it is going to die. In normal development according to Bion, the baby uses projective identification to communicate with the mother. In this case, the baby cries, with the intention of provoking in the mother the same feelings that the baby is having, i.e. "I'm going to die". So the baby has projected its feelings of annihilation in to the mother. The mother, again in the course of normal development, uses her maternal reverie to process these feelings. The mother can recognise the communication contained in the projection, and her response to this communication models for the baby that such communication is real and possible. This establishes or represents a constant pattern of communicative interaction between mother and baby.
As Grotstein (op cit, p.20) points out, we see here one of Bion's innovations in that he broadens Klein's idea of projective identification as a pathological process to one of normal infantile intersubjective communication.

Thus the mother thinks, actually the baby is not going to die and what it needs is a feed, or she investigates what the baby might need. The baby then receives the breast, so pre-conception is met with realization, leading to a conception. For Bion, the development of thought is rooted in the ability to tolerate frustration, or to put it another way, to be able to tolerate not knowing whether the breast will return. Perhaps the next time the baby feels the absence of the breast, due to the memory of its past experience, it can wait a little longer before the mother reacts and in that space where the baby is tolerating frustration it can think about what is not there. Thus the baby can create a mental representation of the absent breast, which is a thought.

Further, Bion considers the formation of a conception to be part of an ongoing cycle. He proposes that when a conception is formed, part of it remains "unsaturated", i.e. part of its meaning or the understanding it represents is not fully formed. In this space of "not knowing", the search for the next realization and the formation of "higher" concepts can take place. In simpler terms, every piece of understanding that we attain has within it the seeds of further questions which we go on to (painfully) explore.

Bion proposes that these processes do not just occur during infancy but are in fact the underpinning of human thought at all stages of human development. It is a theory of epistemology and not just of mother-infant communication. If we apply this epistemology to the classroom, then teachers can, similarly to the mother in infancy, act as a container for the child's frustration extant in the process of learning, and thus allow "thinking" to develop.

4.3.1.2 Without Memory and Desire

In his "Notes on Memory and Desire" (1967), Bion recommends, or if we stay true to the language of the paper more closely, directs, that the analyst working with the patient, should suspend memory and desire. With regards to the former, Bion specified this as desire derived from the senses – memories triggered by sight, sound and smell, referring back to previous experiences with this patient. Desire in this case relates partly to the desire for knowledge or certainty:

> "What is `known' about the patient is of no further consequence: it is either false or irrelevant. If it is `known' by patient and analyst, it is obsolete. If it is `known' by the one but not the other, a defence or grid category 2 element (1,2) is operating. The only point of importance in any session is the unknown. Nothing must be allowed to distract from intuiting that." (Bion, ibid, p.272).

Did Bion mean that the analyst should never think about “what is known about the patient”?

How, in his epistemology, is concrete theoretical knowledge related to tacit experiential knowledge? If we are to use Bion to “plug the gap” in Schön’s theorizing of reflection in action, then this needs to be addressed.

The original 1967 paper is presented in dialectic form, with Bion’s paper followed by responses from several discussants, and a final response by Bion himself.

It could be, as several of the discussants suggest, that Bion is saying that the analyst should not project, based on his sense activated memories, or theoretical constructs, into the developing thoughts of the patient. If you do, you run the risk that your desire for an outcome, a cure, or an end of the session, or to neatly fit the patient in to an existing theory rather than struggle with the unknown, will deflect you and the patient from what is really going on.

How will you actually get to know what is really going on? For Bion, the answer is bound up with O.

Grotstein (op cit, p.68) describes O as “Absolute Truth, Ultimate Reality, infinity, godhead”. It is clearly derived from the Kantian noumena. Certainly, according to Grotstein’s interpretation, it has a mystical or metaphysical quality. It is worth noting that it was with the publication of Transformations in 1965 that much of the psychoanalytic community felt that Bion had crossed the line from the generation of mind blowing, revolutionary extensions of Kleinian thinking and technique to mystical irrelevance (Grotstein, op cit, p.21).

In the paper, Bion goes on to say:

> “In any session, evolution takes place. Out of the darkness and formlessness something evolves. That evolution can bear a superficial resemblance to memory, but once it has been experienced, it can never

> be confounded with memory. It shares with dreams the quality of being wholly present or unaccountably and suddenly absent. This evolution is what the psychoanalyst must be ready to interpret." (op cit, p.272)

Something evolving out of the darkness and formlessness is Bion's idea of "O", the reality of things in themselves, that the analyst comes to most effectively by focusing on his responses to the patient's projective identifications. To achieve this focus, memory of past sessions and desire for knowledge must be minimized.

So where do knowledge and theoretical constructs lie when the therapist is without memory and desire?

Bleandonu (op cit) suggests that Bion implies a temporary exclusion, to be followed by a renaissance of the conscious, directed development of concepts, based on psychoanalytic theory. But this is to be based on a reading of the theory which is attuned to the intuited reality of the patient, rather than a reading which starts from the theory and fits or squeezes the patient in to its constraints. Given the detailed, laboured development of psychoanalytic theory that Bion presents in its writings, this seems to make sense.

Grotstein, who is much more drawn to the mystical side of Bion, presents what is essentially the same argument, but with a more detailed treatment of Bion's mysticism. He sees Bion as describing an unending dialectic between conscious and unconscious thought, which is mediated through O. In the analytic session, the analyst's task is to become:

> "intuitively responsive to…his waveband of O, which then resonates with the analysand's psychoanalytic object, his own O, which is characterized by his Ultimate Reality…. Thus the analyst's O becomes resonant on that ineffable "waveband" with the O of the analysand, which the former must then transduces or transform for the analysand in K as symbols in the

form of interpretation; if accepted, it then becomes transformed into the analysand's personal O" (op cit, p.117)

O is always in flux and there is an ongoing dialectic between cognitive verbal "interpretations" in K and the ineffable O. In Grotstein's interpretation, they never come to an end point, but continue in an iterative reflexive relationship.

An obvious question is whether O refers to a universal godhead or to a personal O. As Grotstein points out (p. 120), Bion is sometimes inconsistent on this point. However, Bion's reference to mystical traditions potentially points towards a personal O which, in some way, is the manifestation of a universal O. This is very close to the Judaeo-Christian idea of a transcendental G-d, a part of whom, the soul, is instantiated in the human person. Grotstein in fact refers to Bion's interest in Kabbalah, the Jewish mystical tradition, but more substantively in his use of Meister Eckhart's neoplatonic metaphysics. Bion was certainly not religious, but he followed Kant in recognizing the place of the transcendent in epistemology. In this, he is quite clearly divorced from socio-cultural approaches to knowledge. He transcends the Cartesian split between mind and thought not through positing the self as a knowing subject as a chimera, but through an appeal to the mystical. He follows Kant in predicating human experience on the unknowable flash of creativity or agency that is linked to the godhead. "Becoming" for Bion means becoming attuned to this unknowable flash, and thus achieving our potential as human beings (Grotstein, op cit, p.307). This is an account of human experience, which in my reading, has, at its heart, an enormous commitment to human potential and the possibility of human agency which, through the painful process of engaging with it, has come to terms with anxiety. For Bion, it is this process that the analyst and analysand are involved in when they engage in psychoanalysis.

4.4 Back to Schön and Bion

Schön (1983) eloquently shows the limitations of technical rationality when applied to professional practice, illuminating in particular the failure of the

technical rational model to resolve the tension between expert technical knowledge and the actual practical application of such knowledge in professional practice. His approach to resolving this tension is to propose a new paradigm, “Reflection-in-Action”, in which expert technical knowledge co-exists, in some rather ill-defined way, with tacit practice-based knowledge. Schön characterizes this idea of “Reflection-in-Action” with the example of a tight rope walker. It makes no sense to talk about an abstract knowledge that the walker has which could be separated in some way from their action of walking on the tightrope. A Schön puts it:

> “..the know-how is in the action..a tight-rope walker’s know-how, for example, lies in, and is revealed, by the way he takes his trip across the wire, or that a big-league pitcher’s know-how is in his way of pitching to a batter’s weakness, changing his pace, or distributing his energies over the course of a game…” (op cit, p.50-51)

Schön tries to elaborate this rather hard to pin down idea of the “know-how is in the action” by referring to how such professionals talk about this. So he describes how pitchers talk about “finding the groove” or how jazz musicians talk about “having a feel for” their material when improvising. Yet to me Schön’s attempt to make it clear what he means by the “know-how is in the action” tends to fall short. He clearly thinks that there is such a thing as a body of expert knowledge, and that it relates in some way to what happens when professionals are actually engaged in practice. He doesn’t suggest that engineers and doctors do not have or do not need a body of expert knowledge; rather his argument is about how this knowledge is applied in practical reality. One could rationally argue that even the tightrope walker has a body of explicit knowledge - check the rope is tied at both ends carefully before you start, don’t tip your pole over too far to one side – I’m not a tightrope walker, but you get the idea. They make use of and can consciously talk about this knowledge in relation to their practice. Schön‘s idea of Reflection-in-Action seems to require that there is some way in which this knowledge is flexibly made use of in the moment, in response to ongoing events. He names this process – “being in the groove”,

“having a feel for”, but never manages to go further in explaining how this incorporation of knowledge into practice occurs.

Schön argues that even in complex professional practice, it makes sense to talk about some sort of intuitive “in the moment” reflection by the teacher on what is going on in relation to the child. We can go even further, and suggest that Bion’s dialectic offers one way of interpreting what Schön is trying to get at in his idea of Reflection-in-Action.

Let’s come back to the tight rope walker. As Schön intimates, if they sit on their unicycle, balancing on the rope, and start consciously thinking – “is the pole pushed too far out, did I check the rope properly?” - then we can guess what is likely to happen. If we re-interpret this in “Bionic” terms, we could say that they need to suspend memory and desire – the desire for certainty based on knowledge, and rely on their unconscious intuition. True, in this, the intuition is in relation to the manipulation of a physical object, although Bollas (1979;1992) has shown how we can extend Bion’s ideas to objects. The emergence of the selected fact – “this is the time to move the pole up a few millimetres”, arises based on the walker’s use of his free-floating attention in relation to the physical task. Yet the walker’s explicit knowledge about tightrope walking doesn’t disappear, it is made use of unconsciously as a pre-conception which is then saturated by the actual experience of that particular tight rope experience.

In the classroom, teachers too often have the experience of “being in the zone”. In fact, it is precisely when they have 30 children all vying for attention at once that they could be typified as demonstrating “Reflection-in-Action”. Their (extensive) body of knowledge – about behaviour management, about teaching techniques, about approaches to teaching Maths, about how to model column addition, is not at the forefront of their conscious minds. Teachers don’t have the luxury of taking 10 seconds in the midst of a classroom exchange to think about what they will say or do. Often they need to make decisions and react to events instantaneously, “in the moment”. Similarly to the rope walker, their knowledge about teaching doesn’t disappear, it is made use of unconsciously as a pre-conception, which is then saturated by the actual experience of that

particular teaching experience to create a saturated formation – a thought translated in to action, i.e. the decision to choose a particular teaching strategy in a particular moment.

4.4.1 Theoretical and Tacit Knowledge

For Bion, knowledge about the analysand arises first from intersubjective communication, mediated through the transformation of O. Bion uses the grid (Bion 1963 – see Appendix 2) as both a system of notation useful to the analyst when reflecting on the analytical session and as an outline for how thoughts and concepts emerge. When focusing on implicit and explicit knowledge, the key move in the grid is from rows D to G. D to E is from pre-conception to conception – an unsaturated state of mind meets with a negative realization (this doesn't quite fit, this doesn't quite work), and if the uncertainty can be tolerated, and a flight into an attack on linking avoided, it is possible for a conception to arise. This move from pre-conception to conception is essentially experiential – it involves the analyst being in direct unconscious communication with the analysand. It is inherently implicit, and is not based directly on reference to a set of explicit knowledge.

Combining the horizontal and vertical aspects of the grid, then when conceptions become saturated, the analyst (or the patient) may engage in attention, research and action (columns 4-6), which is intertwined with the abstraction of conceptions into more advanced constructions of thoughts (rows F and G). This construction of thoughts is, for Bion, based on noticing similarities between phenomena, and developing links between them, as Grotstein put it, engaging in "symmetrical thinking for the purposes of comparisons". This happens as a process in the consulting room as the analyst uses his cognitive function, in collaboration with the analysand, to explore the meaning of the shared intersubjective communications they are engaged in (the emerging conceptions). This process of abstraction does not happen in a vacuum, however, but rather the analyst makes connections to an existing body

of psychoanalytical theories – a body of professional knowledge. Bleandonu (op cit) illustrates how this process works:

> "Let us suppose that the statement "I think you hate me" turns out to be a preconception motivated by curiosity (D5 on the grid). The analyst perceives that it is also a realization for the theory of splitting and projection. He will know that the patient is ready to receive an interpretation on the part of his personality that is full of hatred, which he has split off and projected. Instead of recognizing this in himself, he is projectively attributing it to his analyst. Let us suppose that the patient then tells of a dream in which he experiences jealousy. Analysing the latent dream thoughts, it seems that the patient imagines that his analyst has a sexual relationship with an analyst known to both men. The analyst then recognises a realization of Freud's theory of the Oedipus complex. The analyst has identified three elements of the psychoanalytic object: a dream made up of alpha elements, a mythic scenario and a scientific deductive system. The simultaneous presence in three levels indicated that he should be able to make a comprehensive interpretation". (Bleandonu, op cit, p.170)

It is, however, a circular iterative (or dialectic) process – the use of the cognitive comparative functions – attention, research and action, is bounded by the need to realize that any arising conception must inevitably have a "new" unsaturated component. So the arising system of knowledge, or theoretical framework, still has to be grounded in the on-going intersubjective relationship. The analyst needs to keep checking back, on an intersubjective level, that the abstractions that they have made still correspond with the experience they are having with the patient. They need to check that they still relate to the personal O of the analysand. As Grotstein stresses, for Bion, explicit thinking – an articulated theory, a comprehensive interpretation, can only be valid if it arises, is directly articulated to, implicit thinking that equates to an experiential knowing of a human other. Bion's epistemology shows us, and shows us to an extent based on acute empirical observation/experience, that any theory needs to be connected to the intersubjective experience of the professional and the client.

The professional, just as with the analyst, must get to know the client, and use theory in a way that remains true to that intersubjective experience, to the personal O of the client. Further, they must also build a new theory about that client that again remains true to that same intersubjective experience. This is what Bion's epistemology, based on his clinical experience, directs to the analyst, and if he directed it to analysts, it seems likely that he would direct it to the community of caring professionals as well. It is true that the space that the caring professional has to respond to this directive may be limited, it may be, at times, squashed out of existence altogether by policy directives, time and resource constraints, and other pressures. This may be true, but Bion's epistemology inescapably then raises the question as to what kind of activity, if they lose sight of the shared intersubjective experience between them and the client, the caring professional is then engaged in?

5. Methods

5.1 Overall Approach

Following Hammersley and Atkinson (2007) and Price (2004, 2006) two data collection methods were used – observations and interviews. Their application, as discussed in Section 4, intertwined two epistemological approaches. From the perspective of an interpretivist approach to teacher thinking and teacher research (Hammersley and Atkinson, ibid), classroom observations allowed for the identification of events in the classroom that could serve to elicit discussion of teacher thinking in follow up interviews. From the perspective of a psycho dynamically informed infant observation approach (Price, ibid), applied to researching professional practice, the transference and counter-transference experienced by myself as a researcher in the field of activity provided an important additional tool in understanding the teacher's emotional experience working with children with autism in the context of the introduction of a new technology tool. As discussed in Section 4, these two approaches are not necessarily exclusive, and it is reasonable to argue for to the use of infant observation as an extension to an increasing focus on the place of emotionality in some strands of ethnographic research.

5.2 Pilot Study

During the summer term 2008, approaches were made to a number of primary schools, to locate possible candidates for inclusion in a pilot study. One of the key objectives for the pilot study was to test out the use of a psycho-social approach combining classroom observations with follow up interviews.

Arrangements were made to undertake a series of observations and interviews with a Year 3 class teacher working in an inner London primary school. Four observations and three interviews were carried out, using the methodology

indicated above, from October to December 2008. Interviews were audio taped and transcribed. Following Price (2004) limited notes were made on observations during the actual observation and then more detailed field notes were written up directly after the observation. A thematic analysis of both observation field notes and interview transcripts was undertaken from January to March 2009. A supervision meeting was held with the supervisory team after the first interview and observation, and recommendations in regards of the observations were made. In particular, a recommendation was made to focus more closely on one child in the class for each observation, and to observe for around one hour maximum and then to write up notes as soon as possible after the observation. These recommendations were adopted for the remaining observations.

The experience of undertaking the data collection phase of the pilot proved very useful in terms of application of the method and guidelines for the main project were derived:

- In the initial observation, I had not made it clear enough to the class teacher that my position would be that of “interested visitor”. This caused some confusion from the perspectives of the teacher, me and the children as to my role in the initial observation. I reviewed this issue with the class teacher after the first observation and was much more explicit about what my role should be. The key recommendation for the main study was that achieving a clear position in my mind as to my role as an observer, and communicating this clearly to actors in the field of study is important.
- The clarity of the observations was much improved by focusing on one child. In fact, in the class under observation, one child, Leo, had a likely diagnosis as being on the autistic spectrum, and this child became the focus for the observation series. This approach, modified to a focus on the teacher’s work with one child, was adopted in the main study.
- The interviews did allow for the elicitation of teacher thinking in relation to events observed in the classroom, and as such validated the potential efficacy of the approach in exploring teacher thinking.

5.3 Applying an Observation+Interview Approach based on an infant observation model

Classroom observations and interviews were scheduled in advance with the class teacher. Teachers had been provided in advance with an information leaflet explaining the objectives of the PhD sub-project, and the use of a psychodynamic approach.

Following on from the experience in the pilot study, the objective for sequences of observations and interviews were:

Interview 1
1st and 2nd Observation
Interview 2
3rd Observation
Interview 3
4th Observation
Interview 4

Interviews and observations were undertaken with five teachers.

5.3.1 Interviews

The initial interview serves to set the scene, and focused on deriving information about:

a) the teacher's background in teaching generally and in working with children with autism specifically
b) their attitude towards ICT generally and their perceptions of its use in the classroom
c) their overall approach to working with children with autism

d) introductory information about the focus child(ren) who would be using HANDS in the classroom
e) their expectations and hopes for how HANDS might be used

The follow up interviews focused on:

a) Following up on particular interactions between teacher and focus child from the preceding observation(s) and exploring the teacher's thinking in relation to these, particularly in regards of making decisions about strategy selection and more broadly how to work with the children as evidenced from the observation
b) In the context of (a), as well as previous interview responses, the teacher's ways of working with children with autism and the sources that they draw on when making decisions about how to work with them, with (appropriately timed) explicit reference to training, diagnostic information about the child, input from specialist colleagues and previous experience working with other children
c) Indirectly, their conceptualization of autism (positioning in terms of social and medical models), the significance to them of the autism diagnosis, attitudes towards social and life skills development and the development of autonomy, and tensions between developing autonomy and the limitations of the autism diagnosis
d) Indirectly, in the context of (c), on-going uncertainty about working with the focus child and children with autism more generally. At certain points, where appropriate, usually in the 3rd and 4th interviews, explicit questioner references to uncertainty and "not knowing what to do" where made.
e) Their general orientation towards the HANDS tool, and the orientation of the focus child towards HANDS
f) Where specific instances of HANDS being used were seen in the preceding observation, following up and exploring teacher thinking in relation to the use of HANDS, and where relevant, a focus on areas (b) to (d), where the use of HANDS may serve to stimulate thinking in relation to these . In fact, in many interviews, teachers talked directly

about areas (b) to (d) in relation to their use of HANDS without significant interviewer prompting

Interviews were semi-structured, in that a flexible interview guide was developed for each interview stage, matching the outlined areas of focus. Questions were phrased in an open, exploratory manner, and respondents were given a significant degree of leeway in interpreting the questions in their own frame of reference. Frequent use was made of follow-up probing questions depending on the response given. Certain topics, particularly on-going uncertainty and their conceptualization of autism, were approached obliquely rather than directly, although a more explicit approach was taken if felt appropriate in the later interviews.

As interviewer, I balanced the need to cover a broadly similar range of topics between respondents (paying attention accordingly to the amount of time allotted for each interview section) with allowing respondents to explore their personal response to the questions. This broadly non-directive approach is aligned with an interpretivist framework based on symbolic interactionism as it largely allows the respondents to interpret the questions in terms of the meaning that they have for them. It aligns with the use of interpretivist and specifically narrative approaches in teacher thinking/teacher research studies. For example, both Elbaz (1983) and Nias (1989) report that questions that are too specific and too tied down are not productive. My experience of using such an approach in the study was that interview responses tended to be richer and go further towards the overall objective of exploring their thinking in depth.

At the start of the first interview, during the first formal contact with teachers as part of the PhD study, they were asked to sign the study consent form and whether they had any questions. General consent for classroom observations was given in writing by the head teacher, and all parents with children in classes where HANDS were being used were provided with an information leaflet and given the option of withholding consent from their child being involved in

observations. Children who were involved directly in using HANDS gave explicit consent for participation in classroom observations.

Interviews were recorded and then transcribed, usually within two weeks of the interview taking place.

5.3.2 Observations

At my first meeting with the teachers I was explicit in stating that I would be adopting a “non-participant observer” role. Most teachers were happy with this position although there were some attempts, particularly by Kathy, to draw me into active participation. Although these attempts were partially successful in initial observations, a review of the experience with supervisors helped me to maintain boundaries more successfully in later observations with this and other teachers.

Requests were made to teachers in advance of observations, excluding the first one, with the aim of incorporating the use of HANDS into the observed session.

The objective in the observation was to consider:

a) The overall academic focus on the lesson, including the particular learning tasks
b) The teacher’s overall interaction with the group
c) The interactions between teacher and focus child, including use of language and voice tone, physical movement and positioning around the classroom, emotional registers and attention to the learning task
d) Particular instances of direct interaction with the child, including behavioural and learning task directions and interventions
e) Interactions between the teacher and other adults in the classroom, particularly as they related to the management and support of the focus child

f) Social interactions between the focus child and other children in the classroom

g) Use of technology generally in the classroom by both the teacher and the focus child

h)Interactions between other adults in the classroom and the focus child, particularly cooperative working between the teacher and those adults

The guidance for a typical infant observation approach, particularly as laid out in *Closely Observed Infants* (Miller et al. 1997), was largely adopted in the classroom observations. Miller and colleagues, influenced by Bion's clinical approach, recommend the use of a largely free-floating attention, which although it is informed by a particular curiosity about intra- and inter-psychic events, does not mentally foreground these, particularly from a theoretical perspective, in the process of observation.

The rationale for this is that if they were in the foreground, then they would potentially push the observer into premature conclusions about the true nature of the psychic events unfolding in the field of observation. This rationale, as well as a concern not to interfere with the free floating attention of the observer, also leads to a general recommendation to a) not to take notes during the observational session, and b) to adopt a non-participant stance in the observation.

Close attention is given to focusing on (and recording in the observational record) what goes on in the observational session – the use of language and tone by the mother, the physical and facial reactions of the baby, the close pattern of interaction between the mother and the baby.

Further, again in order to avoid coming to premature conclusions, the initial observational record is written up without detailed psychodynamically informed interpretations or reference to theory. Where there is a particular need to record these at the time, they are placed as footnotes outside the main narrative of the observation.

The observational record is then reviewed in a work-study session. Miller's view is that the emotional interaction between baby and mother is very strong, and that when exposed to these strong inter-psychic communications, there is a significant chance of the observer initially repressing their counter-transferential reaction to them. Accordingly, Miller notes that trainees in infant observation often say that they observed very little - "the mother fed the baby and that was it". Review in the work-study group allows the observer to make use of colleagues as auxiliary egos, and by joint mindful attention to the written record, to uncover some of the inter-psychic communication that occurred in the observation. Again, following Bion, the work-study group can be seen as acting in a containing role, processing the initially difficult material presented, so that the observer can begin to make sense of the material, identifying what may have initially been unprocessable, thus making effective use of their counter-transferential response to the material.

This approach was largely followed, with obvious modifications, in my classroom observations. I adopted a non-participant observer stance where I adopted free-floating attention to the interactions between teacher and focus child, with, however, the overall objectives for observation listed above the "background" of my mind. However, sketch notes were made during observations, including noting physical positioning of actors in the classroom. A detailed observational record, modelled on infant observation recording, was made as soon as possible after the end of the observation, usually within 2 hours and at most within 12 hours. The narrative of the observational record did not focus on interpretations or theory, and instances of particularly strong emotional register and any initial theoretical considerations were recorded as footnotes.

Although it was not possible to schedule work-study group reviews of the majority of the material, at least one observation from each teacher was brought to a work study group. The experience of working through this material did demonstrate the efficacy of the infant observation approach in considering professional practice. Material, which on my first analysis seemed either uneventful, or difficult to interpret, was rendered more potent and

understandable through the process of a work study review. In particular, my strong identification with HANDS, and its potential interference with my interpretation of the material, was revealed in the process. In several work study sessions colleagues noted how material suggested significant negative feelings about HANDS. It was also interesting to observe, in the work study sessions, my initial strong negative reaction to these comments from colleagues. However, during the sessions it became clear that my role as "lead academic" for implementing HANDS at the school had led me to be overly identified with a positive outcome for HANDS, making me (unconsciously) resistant to the negative messages about HANDS from the teachers present in the observational record.

5.3.3 Emotional Register in Interviews

Although not a primary focus, I did consciously set out to pay attention to relevant feelings that arose during interviews, including potential counter-transferential responses. Where such responses came in to conscious awareness, they were noted in interview field notes. Some accompanying interview material was also brought to work study review sessions. Colleagues in work study review did give some useful insights into some of the positions adopted by teachers in the interview records, particularly were I had again, due to my dual role, been resistant to some of the negative messages about HANDS that were being presented.

There were, however, relatively few instances of strong emotional or counter-transferential response noted in respect of the interviews. However, in one informal conversational interaction with the school Educational Psychologist, directly after an interview, a very strong emotional response related to an incident in the observation was noted. It may be that the need to follow an interview guide, with a concomitant requirement for quite strong cognitive attention to particular lines of thought, may have interfered with the ability to be properly attentive to emotional interactions in the interview. It could be that an unstructured interview format, perhaps more closely following the pattern of a

clinical psychoanalytic session, may be more successful in allowing for sensitivity to the emotional register of the interview material.

5.3.4 Variations to Infant Observation

The major innovation that I introduced into my modified infant observation approach was the use of audio recording of the classroom observations. An Olympus voice data recorder with a tie clip microphone was used to record classroom observations. After the initial write up of the observation following the observation itself, the observational record was reviewed with the audio recording. In this review, the audio recording is listened to at the same time as viewing the initial observational record. The intention was not to produce a verbatim transcript of the recording, but rather to amend the observational record for accuracy. Thus, events which were initially recorded in the wrong sequence would be repositioned, and dialogue which was in paraphrases or inaccurate in the initial observational record was similarly updated. Verbal sequences in the audio recording which were relevant to the narrative of the observational record were written down in detail, although in some cases, either due to lack of strong relevance or time constraints, the record was left in its initial summary form.

The rationale for adopting this modification was external indirect pressure from other members of the broader HANDS research team both at London South Bank University and in the Cognitive Psychology and Persuasive Technology research teams. It was felt by these colleagues that a purely memory-driven approach to classroom observation was hard to justify on reliability grounds. Largely in response to this, I decided to introduce audio recording as a means of increasing the perceived reliability of the observational record.

5.3.5 Challenges to Infant Observation

This challenge from the HANDS team reflects, of course, wider methodological concerns about the use of modified infant observation as an interpretivist research method. In Section 4.2 above I noted that Frosh and Baraitser (2008) have challenged the idea of applying psychoanalytic concepts and techniques to qualitative research. Their critique focuses partially on the modernist approach of Kleinian object-relations. They are partially willing to admit that the inherent split (according to their interpretation) in Kleinian (and to a lesser degree although still present) in Bionion thought between a knowing therapist and not-knowing patient can be relevant to the consulting room. But their critical position leads them to be suspicious of the stretching of these ideas, based as they see them on a split between the individual and society, to the broader field of qualitative research outside the consulting room. Their solution, of course, is an appeal to a reflexive Lacanian psychoanalysis, where “Psychoanalysis has more to offer when its disruptive and performative elements are placed in the foreground, that is, when the kind of reflexivity it advances is one that acknowledges the way the phenomena of the psycho-social are produced through the actions of analyst and analysand, researcher and researched” (ibid, p.363). Hoggett (2008) in his response to their paper in the same journal issue points out that the Frosh and Baraitser’s (op cit) critique of the possibility of a unique claim to knowledge inevitably tends to undermine the clinical recognition of real difficulties and of clinical work that can lead to promising outcomes.

Responding in a similar vein in the same special issue, Rustin (2008) argues that the implication of Frosh and Baraitser’s position is that you end up with not much of psychoanalysis that might actually be useful in the clinical context. However, this does not answer the underlying challenge laid out by Frosh and Baraitser (op cit), namely, can you apply psychoanalytic techniques outside of the consulting room without stretching them so far beyond their intended field of application that they snap? And the snapping is viewed from the perspective of the wider field of interpretivist researchers. This question is just as relevant from such researchers adopting a realist position, as then issues of validity and reliability become even more important. Surprisingly, there seems to be very

little, if any, direct consideration of this particular issue. Although a small number of papers on the application of psychoanalysis to wider professional issues regularly appear (see for example Rustin 2006; Shuttleworth 2010), I was not able to locate significant detailed consideration of, for example, the issue of respondent validation. However, Hinshelwood and Skogstad (2002) do point out that the ability of the therapist to undertake interventions in the clinical setting is not typically something that a researcher can engage in. The use of counter transference in all forms of Kleinian technique is based on validation of interpretations by the patient. The therapist suggests an interpretation, in the on-going context of the consultation, and the patient gives a response. Whether or not they agree with the interpretation, their response gives a significant amount of additional information to the therapist and thus their use of the counter transference is grounded, so to speak, in an on-going intersubjective dialogue between therapist and patient. No such on-going dialogue exists in either typical infant observation or its application to qualitative research. How then can we have confidence, even with the use of auxiliary egos of the work study group (none of whom it will be noted were even there with the research subjects or the infant), that the conclusions drawn from the use of counter transference are reliable?

An additional challenge, particularly for those adopting infant observation from a realist perspective, for which again there seems very much an absence of debate in the infant observation literature, is on the place of memory, i.e. is it possible to accurately recall what went on in a lesson one hour or more later? If realism attempts at least to identify the traces of an independent reality, then most realist interpretivist researchers would consider that it has a better chance of doing so if its methods of data collection can be regarded as having a significant degree of validity and reliability (i.e. correspondence with that reality). This does not mean that we need to go back, in respect of classroom research, to the paradigm wars, as laid out by Gage (2007), where from a quantitative perspective, only structured classroom observations amenable to regression and correlation techniques can be considered as having reliability. Rather, we can, from a realist perspective, suggest that there can be an intermediate position where we do not rely on the function of memory recall at a distance. It

is also relevant to note here that such critiques about the use of memory based recall could also be applied to ethnography and anthropology more widely. Critical ethnography and infant observation make a broadly similar response to this challenge, although for the latter it tends to be implicitly assumed rather than formally stated. In essence, they return to Frosh and Baraitser's (op cit.) analysis, in which there is no normative independent truth about the interaction between observer and researcher or therapist and client and what exists (and can only be said to exist) is respectively the construction or co-construction of a particular interpretation.

However, from an infant observation perspective this argument seems weak, particularly if we admit Rustin's response to Frosh and Baraitser, and do sign up to the existence of real problems and real therapeutic interventions based on psychoanalytic theory and technique. If psychoanalysis is based on a realist perspective as Rustin suggests, then how can infant observation rely on an argument which sounds very much like a critical perspective when arguing for the use of data collection methods?
A stronger basis for the argument against the use of audio recording in infant observation is that the introduction of recording equipment acts as a distraction - it both interferes with the field of study and distracts the observer from applying free floating attention. However, my experience using an essentially hidden audio recorder was that there was relatively little, if any, of such interference with the field of study. Once I had put the recorder on, it just sat there in my pocket and I could largely forget about it.

Further, the significant discrepancies between my initial observational record and the audio recording indicate that the reliance on memory alone in modified infant observation techniques is likely to lead to the introduction of significant distortions. It seems hard to argue that these distortions are irrelevant. This is particularly the case where in work-study colleagues rely to a large degree on the written observational record in making sense of what went on in the classroom. Much significance can be attached to the use of a single word in work study review. Surely it makes a difference if potentially that word was

never said or another word entirely was used? Of course, a similar argument can be made in respect of traditional mother-baby infant observation.

Another important challenge is raised by Frosh and Baraitser (op cit) in relation to psycho-social research informed by psychoanalysis, as well as more broadly by many in relation to the psychoanalytical enterprise as a whole. As discussed in Section 4, this centres on the questioning of the validity of using a privileged knowledge about the dynamic unconscious which cannot be separated out from an on-going intersubjective experience between therapist and client. In other words, a realist account of reality based on assigning agency to actors in the field would potentially be in conflict with a psychoanalytic account which claims rights of knowledge which the actors themselves have no access to. If realism is seen as essentially disagreeing with Marxist and Foucaldian false consciousness, then how can it admit psychoanalytic “un- consciousness”? In terms of realist interpretivist research, this question comes to the fore when using counter transference to make judgements about the motivations and actions of actors in the field of study. I was concerned about this aspect of the use of a modified infant observation approach from the pilot study onwards. The analysis of the data from the study presented here did throw this question into stark relief. In some instances, source references could have been, if a typical interpretivist approach based on symbolic interactionism had been applied, assigned to radically different data categories than those which resulted from a psychoanalytic lens.

Of course, the answer, again considered in Section 4, is that we can legitimately regard the psychoanalytic lens, as Freud did, as simply another way of finding out about the reality of the world. Even in purely symbolic interactionist accounts, it is never possible to take everything that the actors say at face value. Conflicting accounts, both by the same actor and between actors, and multiple motivations all need to be resolved in any interpretivist analysis. In fact, in a number of occasions in the data analysis, it became clear that the application of a psychoanalytic lens was allowing me to uncover hidden motivations and desires that, it could be argued, were more closely aligned to

the real experience of the actors than the initial accounts given in surface interview responses.

5.3.6 Issues of Timing

In this study a limited number of observations and interviews were undertaken with each individual teacher over a limited time frame. In contrast in classical ethnographic and some other forms of interpretivist research, researchers would spend significant extended periods of time with their research subjects and/or engage in repeated interactions allowing for tracking of changes over meaningful periods of time. In a more limited study such as this, it needs to be recognized that what is true of the subject's experience in one particular time frame may not be true for other time frames and this needs to be recognized as a limitation of the research.

5.4 Ethical approval

HANDS was an ethically grounded project. An independently constituted ethical board, headed by an internationally recognized expert on bio-ethics, as well as including parents of children with autism and representatives of NGOs working with people with autism, was an integral part of the overall project. All project activities, including the use procedures for implementing HANDS with children and their teachers, and all the evaluation methods, were subject to approval by this board. In addition, separate ethical approvals for all the evaluation procedures involving LSBU were submitted separately for approval to the University Ethics Committee. These separate applications to the HANDS Ethical Board and LSBU Ethics Committee included all the activities involved in the PhD sub-project. Further, a separate ethics application for the PhD sub-project was made to the UEL Ethics Committee. Approvals were gained for these applications. The key ethical principles included informed consent, to include both parental and child consent for use of HANDS and for involvement in

evaluation procedures and also informed consent by teachers for involvement in evaluation procedures.

5.5 Approach to Data Analysis

5.5.1 Deductive and Inductive Approaches

Data analysis methods in interpretivist research can be divided into deductive and inductive approaches. Inductive approaches, such as Boyaztis (1998) or the particular grounded theory method outlined by Strauss and Corbin (1998), are based on starting from the data, i.e. from the text of transcripts and field observation notes, and building up concepts and larger themes from a close reading and analysis of the text. In contrast, deductive approaches, such as that outlined by Crabtree and Miller (1990) start from a priori concepts that are derived from prior research questions or the literature, and then analysing the text to see whether, or if not, the text fits with these a priori concepts. An alternative way of looking at this split is that induction means generalising from individual cases (i.e. producing wider concepts from particular instantiations of a concept in the text) and that deduction means identifying a specific example of an already produced wider concept in the text.

Strauss and Corbin (op cit) indicated that the strength of an inductive approach is that it allows you to remain open to what the text says (what it “speaks”), and thus avoid introducing your own biases (particularly your own ideas about what the answer to your research questions should be). It also allows you to pick up on novel and interesting, and possibly very important ideas contained in the text that you may otherwise miss.

5.5.2 Critiques of Induction

Miles and Huberman (1994, Chapter 1, p.1-8) present a critique of inductivist approaches to interpretivist research, arguing that a purely inductive approach

is not possible. They point out that the process of research, from the very initial idea of a project, involves a process of selection and filtering, and that this process, whether explicitly stated or not, is based on existing a priori categories (preferences, ideas, values, dispositions etc..) that are present in the minds of the researchers. They argue that it is better to be explicit about the a priori categories that you are using, rather than falsely claiming an (in fact unattainable) inductive “purity” and that, in fact, being explicit leads to better research because in their view it is illogical not to have your research questions in mind when you are coding.

They make further critiques of the purely inductive approach as follows:

- The bounded reality of research programmes means that it is rarely, if ever, possible, to approach either the process of data collection or analysis from a wholly “tabula rasa” position
- The volume of data created in interpretivist research means that, due to inevitable limitations of human processing capabilities, you must have an element of selection in terms of what aspects of a study (both in the field in data collection and during analysis) that you focus on. If you don’t the risk is that you end up wasting time on “dross” and that the chances of your analysis becoming incoherent increase.

5.5.3 Overcoming the Split

A close reading of Strauss and Corbin (op cit, Chapter 3, p.35-54), and Miles and Huberman (op cit, Chapter 1), reveals that in fact the dramatic split between inductive and deductive approaches, in terms of the actual practical activity of analyzing text-based qualitative data, is not as great as it may first appear. In fact Strauss and Corbin point out, what is in some ways an obvious point, that typical scientific experimentation usually proceeds by a mixture of both deductive and inductive approaches, and that this also tends to apply within the Human Sciences. There is a general agreement between these key authors in the field that interplay between inductive and deductive approaches

to considering the data is necessary throughout the analysis. Their disagreement is more in emphasis. Strauss and Corbin use induction from early on in the process, and see it as primary in developing initial ideas and concepts at the start of the fieldwork, that can be tested out in an iterative fashion, as the fieldwork progresses. Miles and Huberman are much keener on using high level a priori categories early on, and then revising these based on a close analysis of the text during data analysis, but importantly they see any revision of initial categories based on close reading of the text as a central part of the process.

It is relevant to note that this difference in emphasis between inductive and deductive approaches in qualitative research mirrors the broader split in the Human Sciences between scientist or psychological approaches and interpretivist approaches based on developing “thick” descriptions of human activity.

5.5.3.1 Integrating Inductive and Deductive Approaches

Other authors have produced more explicit research frameworks integrating deductive and inductive approaches. One example is Fereday and Muir-Cochrane (2006)’s procedure for thematic analysis, which includes these steps:

1) Develop a code manual, based on research questions and theoretical concepts
2) Test the reliability of the codes by testing them on a data sample
3) Close reading of the raw data – this is the first step in the actual analysis and summarizing the key points that arise; leading to inductive codes being added to the code manual
4) Connecting the codes and identifying themes

(ibid, p.84)

5.5.4 Approaches to Coding

Whether inductive or deductive, interpretivist approaches to data analysis involve coding of text – that is assigning pieces of text to categories that have a particular meaning, thus allowing for sense to be made of the mass of data. The sense to be made can be either descriptive or can, as Strauss and Corbin propose in their method, lead to theory building – i.e. to developing explanatory concepts that don't just describe the phenomena under investigation, but explain why they have come about (and potentially what could be different causally in the future).

5.5.5 Strauss and Corbin – Theory Building via Open and Axial Coding

Strauss and Corbin (op cit, Chapter 7, pp.87-100) propose two conceptual (although in practice interwoven) approaches to coding. First (conceptually) is *open coding* where codes are initially derived from the text. They recommend a microanalysis of the text – where the text is read closely and emergent codes assigned as they arise in the mind of the researcher. These emergent codes are then developed in to categories, and in particular attention is paid to properties (what defines the category) and dimensionality e.g. frequency and intensity. They suggest that this can be done line by line, but equally well by analyzing at sentence or paragraph level.

Open coding can be regarded as breaking down the text into categories. In *axial coding,* phenomena (important analytic ideas that explain what is going on) are developed by identifying relationships between categories. It is termed axial because, "coding occurs around the axis of a category, linking categories at the level of properties and dimensions – for example, "teenagers from middle class homes tend to engage in limited drug experimentation." The process of axial coding is supported by the use of detailed memos during the process. A memo is a note made by the analyst of his developing thinking about the characters, events, interactions, actions under investigation, i.e. the field of study. Such

memos are contingent and evolutionary – potentially being shared with colleagues and leading to the development of explanatory (theory level) codes.

5.5.6 Deductive Coding

Although starting from an existing a priori set of codes, Miles and Huberman's coding process essentially mirrors that of Strauss and Corbin, in that they consider different levels of coding as follows: (op cit, Chapter 4, pp.51-88):

- Descriptive
- Interpretive
- Pattern
- Causal Link
- Theme

Conceptually, creating pattern codes mirrors axial coding in Strauss and Corbin's scheme. Miles and Huberman also suggest, in line with Strauss and Corbin, that there should be an iterative process, whereby pattern codes, once initially formulated, are checked for consistency and explanatory power against later text samples. They strongly recommend the use of computer packages to help with this process.

They also recommend the use of memos as a device to support the development of the analysis, as well as the use of case analysis meetings and interim case study reports (op cit, pp.72-76). The latter should list the current state of the research questions, a description of the overall structure of the case, and emerging causal relationships.

5.5.7 Initial Deductive Coding Schemes

Miles and Huberman (op cit, Chapter 4) suggest starting with a list of 12-50 codes. High level concept "bins" are seen as being essential in properly guiding

the progress of the study. It should be noted that they recommend these are used initially during the field work – each visit should be written up and provisionally coded so that the list of codes can be revised iteratively as the data comes in.

5.5.8 Coding for Process

Strauss and Corbin (op cit) focus strongly on coding for context and process, i.e. the ways in which structural contexts influence the behaviour of actors and events, and the relationship between actions/interactions and consequences. This is partly based on their affinity for close microanalysis of the text, and partly because of their interest in coding for the development of explanations of phenomena. They define phenomena as “repeated patterns of events or happenings, or actions/interactions that represent what people do in response to the situations/problems they are in”. The focus on interactional sequence is clear here. In particular they show a specific interest in:

a) Looking out for connectives such as “because” and “as a result of” in the text.
b) Being sensitized to process questions such as “what problems/issues/happenings are being handled through action/instruction?”, and “what conditions or activities connect one sequence of events to another?”, and “how do consequences play in to the next series of interactions?”

(op cit, Chapter 11, pp.163-180).

In considering structure (context) / process relationships, they also make the point that in their view, the distinction between micro and macro in process is false and that both should be considered. This contrasts with Miles and Huberman’s typically more restrictive position, where they caution against widening the field of study too widely (op cit, Chapter 2, pp.16-33).

5.5.9 Case Studies

Much intepretivist research is presented as case study research. It is not, however, always clear what the significance or meaning of the term is. Yin (1981) defines a case study as a *research strategy*, that "examines a contemporary phenomena in its real life context, especially when the boundaries between phenomena and context are not clear" (p.59). Yin considers that a case study can be contrasted to other research strategies such as experiments or histories. A case study is suited to explanation rather than incidence research questions.

Yin (op cit) also specifies different types of case study:

- Exploratory
- Descriptive
- Explanatory

Cohen, Manion and Morrison (2007, p.258-259) in their influential later work on educational research methods broadly accede to this consideration and classification of case studies.

In considering the function of a case study, in a similar vein to Flyvbjerg (2006), Yin sees it as a reasonable design for an investigation which "builds explanations" (op cit, p.61) and that stands on its own terms (i.e. not just as an exploratory precursor to later, wider-scale experiments). He likens the concept to that of a detective investigating a crime – the detective redacts the facts of the case as accurately as possible, considers possible explanations, and then selects the one that best fits the available evidence (op cit, p.61)

Yin also considers strategies for comparing across cases (op cit, p.62). He considers cross-case surveys, where particular factors are cross-tabulated across cases. He cautions, however, that this doesn't work well for small numbers of cases. In addition, and more importantly, he points out that it is undesirable in any event as the extraction of single factors from the case unduly

simplifies the phenomenon being studied, and further treats cases as data points when really they are better thought of as coherent explanatory things in themselves (op cit, p.62).

In contrast, Yin prefers a cross-comparison approach. He uses the detective example again to illustrate this – the detective has one initial crime for which he has an explanation. He then comes across a second, somewhat similar crime. He then applies his explanation from the first case, but of course modifying (or discarding it) it to fit the specifics of the second case. This leads to theory generation (op cit, p.63).

5.5.10 A Psychodynamic Perspective

As I have indicated, it is possible to argue that we can view the application of a psychodynamic lens to interpretivist research, specifically the use of a modified infant observation approach, as just a method to help find out more about the emotional experience of the actors in the field of study. As such, the arguments presented about deductive and inductive approaches and case study development could be considered to apply equally well.

However, Yin's point about the problem of treating cases as data points rather than explanatory things in themselves needs particular consideration from a psychodynamic perspective.

5.5.10.1 Psychoanalytic Research

It is relevant in this context to consider extant debates about validity in research on psychoanalysis, by which I mean studies designed to demonstrate the efficacy of the application of psychoanalysis in bringing about positive treatment outcomes. Rustin (2006) refers to calls from theorists such as Fonagy (2003)for the application of more standardized scientific approaches commonly used in clinical and cognitive psychology, such as treatment outcome studies, to psychoanalysis. Fonagy usefully sets out the main reason why quantitative

(deductive) research techniques are viewed with such suspicion by psychoanalysts. Their objection essentially mirrors critiques in the educational paradigm wars of the application of positivist psychology to educational research. Fonagy summarises the issue as follows:

> "The kind of narrative making which psychoanalysis entails is so central to the experience of personal meaning, that it will probably always be vital to understanding human nature. The complexity of psychoanalytic theorization is defensible because the content of the mind is irreducible and because any assertion of a singular reality is inherently suspect…the world-view that is normally created by working intensively and long-term with disturbed individuals is incompatible with the ethos of tightly controlled studies. Those who work at close quarters with the human mind will inevitably have an impression of reductionism when they see the full complexity of an individual's struggle with internal and external experience reduced to a single 100-point scale…" (ibid, p.131)

As both Fonagy and Rustin recognize, a possible solution to this impasse in psychoanalytic research is to

a) Despite the reservations of analysts, make greater use of treatment outcome studies which can demonstrate the overall efficacy of psychoanalytic treatment when compared to other forms of intervention. There does in fact seem to be an increase in studies such as this. For example, Deakin & Tiellet Nunes (2009) report on a 12-month study of the use of psychoanalysis with children in a clinical setting, using the Rorschach, Bender and WISC III tests, which demonstrated statistically significant improvements in anxiety problems and school relationships.

b) Place a greater emphasis on qualitative methods in assessing, from a technical point of view, what works and what does not work in the consulting room.

Importantly, in respect of the latter, both authors recognize that something more is needed than just the typical clinical case study report, which is perhaps rightly open to criticism as methodologically underpowered in that it is very often hard to see how what is presented about one case might be usefully generalized across to other clinical contexts. In this respect, Fonagy highlights the significant need for a screening process that would help identify which patients are likely to benefit from treatment. It is hard to see how isolated psychoanalytical clinical case studies could usefully address this.

5.5.10.2 Implications for Psychodynamically Informed Interpretivist Research

Carlberg (2010) reports on the use of a systematic case study approach, where turning points in therapy are used as an interactional sequence to identify similarities in conditions, activities and consequences across cases. Carlberg's studies involved the use of semi-structured interviews of therapists, questionnaires to clients and reference to process notes.

This systematic case study approach serves to maintain the integrity of the single case, with its complexity specific to the experience of the individual therapist and patient. At the same time, using thinking similar to Yin, it opens up the possibility of identifying common process themes across cases. Clearly, Carlberg's cases are about psychoanalysis. However, it does not seem too far a leap to propose that this systematic approach could also be applied to the use of a modified infant observation approach to researching professional practice. It allows the single case, with its complex, situational emotional field, to be preserved, as the same time as allowing comparisons in respect of key processes across cases.

5.6 My Analysis

5.6.1 Scope

Following Yin (op cit) and Carlberg (op cit), the essential unit of analysis was the case of each individual teacher. The field of study in respect of the case extends out primarily to the focus children, and the HANDS technology and its use. In particular, in work study group review, although it was not possible to look at all textual material relating to each teacher case, the unit of analysis was nevertheless the teacher as a case. Tentative interpretations about psychodynamic processes going on in the observational material reviewed in the work study group were then further “tested” out by me against the other observational and interview material.

It would have been possible to have stopped there. As with many clinical case studies, a narrative record of my impressions of the teacher case could have been constructed based on the observational material and the work study review interpretations. Although this certainly involves a mixture of deductive and inductive reasoning from the data, the use of a detailed coding structure, commonly used in qualitative research, could have been avoided. The cases would have been presented as a series of phenomenological gestalts.

However, following Yin and Carlberg, this was considered to be insufficient. This was partly due to issues of reliability. Qualitative research involves the generation of large amounts of text, as was the case in this study. Human processing limitations make it difficult to absorb all this in one go, and if it is presented as a gestalt the conclusions are rightly open to criticism in terms of how the material was filtered in reaching those conclusions. Although coding approaches certainly do not remove this filtering problem, they at least make it more transparent and open to external review. The second issue is that of comparison across cases. A descriptive followed by axial coding approach

allows for the identification of key themes across cases, which can allow the development of explanatory and causal mechanisms. It also, by identifying the number of instances in which a category type occurs, again allows for increased confidence in conclusions that are made when considering the relevance of phenomena both within and between cases.

Accordingly, in this study, both descriptive and axial coding is made use of in relation to psychodynamically informed concepts. For example, adhesive identification to the HANDS phone was used as a coding category.
In summary there is a twin track presentation; firstly a “gestalt” of the overall case and simultaneously a between-cases comparison using descriptive and axial coding.

5.6.2 Developing a Coding Structure

In developing a coding structure, following Miles and Huberman (op cit), a mixed deductive / inductive approach was used, but with a greater emphasis on a deductive approach. An inductive approach was used in particular to help, similarly to Fereday and Muir-Cochrane (op cit) in building an initial coding manual. Thus an initial selection of text sources across cases was subject to a line-by-line “grounded” microanalysis. In undertaking this analysis, I tried to free my mind, at least to some extent, of the stated research questions, and to be open to associations and interpretations that arose from the text directly. This resulted in an “inductive” coding structure. In tandem with this, based on the research questions and my understanding of the relevant literature, a “deductive” coding structure was also developed. These two structures were then integrated and applied to the data sources. The coding process involved a repeated deductive/inductive iteration, leading to the review of the codes, to check for ongoing logical consistency and consistency with the text data itself. All data sources for all five teachers, including observations and interviews, were coded, using the integrated coding structure.

5.6.3 Coding for Context/Process

The study is focused on the impact of an innovation in the classroom. As such, context/process relationships are important. Further, each case is constructed of temporarily separated data collection points. Thus coding for context and process makes sense. Line-by-line microanalysis of selected text sources, focusing on context/process particularly in situations where the ICT tool is introduced did serve to illuminate context/process relationships in greater clarity, and did reveal issues that may otherwise have been obscured if a purely deductive approach had been used.

5.6.4 Use of Software

The Nvivo 8 software package was used, as per Miles and Huberman's recommendation (op cit, Chapter 3, p.43), to make the coding process more efficient. The integrated coding structure implemented and applied in Nvivo is shown in Appendix 1.

Memos, and active notations in Nvivo, were used extensively, to aid the thinking process during coding. Process notes from work study group review were included as memos on the system.

Not all data nodes created, particularly some of those from the deductive exercise, were made extensive use of, or "saturated", to use Miles and Huberman's phraseology. Further, some codes were found to duplicate content meaning. Two rationalization exercises were carried out during the ongoing data analysis, in which redundant codes were removed and duplicate codes merged. The Nvivo software's capacity to easily merge codes came in to its own during these exercises.

The query function in Nvivo was also very useful as it made it very easy to quickly derive comparisons across descriptive codes by case. An example is

the derivation of instances of sub-codes per teacher case for the high level data node “Teacher Conceptualisation of and Ways of Working with Autism”.

5.6.5 Outcomes from the Analysis Process

Descriptive coding generally worked as planned, particularly with regards to what might be termed non-psychodynamic phenomena. For example, the high level data nodes “Teacher Conceptualization of Autism and Ways of Working with Autism”, “Teacher Fluency Ability with Technology”, “Technology Issues”, and their sub-nodes, worked straightforwardly.

However, when it came to axial coding, that it in constructing causal/explanatory frameworks based on the descriptive coding, the analysis did not follow the expected pattern. That this was the case was made particularly clear by the fact that in the general HANDS project, a parallel but separate descriptive+axial coding exercise was successful in identifying axial meta-nodes that provided an explanatory framework for the actors in the field of study.

However, in this study, where the emphasis was on using a psycho-social approach, with a psychodynamic lens, the move from descriptive to axial coding was less clear cut. Psychodynamic interpretations were successfully applied to the actors, both teachers and children, in the context of the introduction of the technology tool, but these did not, as was expected, mainly derive from the descriptive codes. Rather, the interpretations made in work study review were applied to the range of the source material for each case, and a broad “gestalt” narrative based on these interpretations formed the main basis for psychodynamic conclusions about the case. Having said this, the Nvivo software itself proved a highly efficient tool in supporting this process as it easily allowed for reference back to the source texts (and in particular the observation annotations), as well as for cross referencing to both the memo notes from work study review and more general memos on emerging psychodynamic interpretations also created during the coding process.

However, in some cases, the descriptive coding further supported a) the search across source material when considering interpretations from work study review and b) collation of instances where psychodynamic interpretations applied in one case were also potentially seen (whether in similarity or contrast) in another case. For example, as indicated, in work study review at one stage my over-identification with HANDS was commented on. The data node “Observer Stance Conflict” in which I had collated a range of source references where I had felt conflicts between my position as researcher and HANDS project implementer was helpful in allowing review and identification of other instances where this over-identification may also have been operating, thus allowing me to consider if I felt the interpretation from the work study review had broader application beyond the observation material looked at in the work study review session. However, in many cases, psychodynamic conclusions about cases were often made without direct reference to the descriptive codes. Whether initially related to interpretations made in work study review or not, they often just emerged when looking across the range of the data sources for a particular case. When this happened, it frequently had no link back to the original descriptive coding. It could be argued that this is what one might in fact expect from a modified infant observation approach. As I discussed previously, one concern about the use of recording methods in infant observation is that they may interfere with the application of free floating attention. It would seem quite possible that in the data analysis as well, the use of codes per se may also potentially interfere with this. It is only when, following Bion, the codes, in a sense, are forgotten about, or at least pushed to the back of the mind, and there is an open attention to the intersubjective emotional tone brought by the material, that the relevant “selected fact” can emerge. So we are brought back to the original concerns of the psychoanalytic body about the use of deductive approaches in psychoanalytic research.

However, once interpretations were made, it was possible to operationalize them by assigning a metacode (or axial code) to relevant source references. This coding was then helpful in facilitating looking across cases to determine whether the phenomenon was present or absent in other cases.

Category coding might then, in psycho-social research, be a useful administrative or logistical tool, but its overuse may lead us to lose the essential quality that gives the psycho-social method its inherent power. Alternatively, I could contend that, in the context of an interpretivist approach, I provided something of a defence against Fonagy's critique on the limitations of the single psychodynamic case study approach.

5.7 Introduction to the Cases

Five teachers are presented: Lynne, Kathy, John, Mandy and Penny. They have rich, complex and varying experiences of working with children with autism and of the introduction of the HANDS tool into their work in the classroom. The cases are presented roughly in the following pattern:

1. Their background, teaching history, general attitude to working with ICT in the classroom and role in the school
2. An overview of the children using HANDS that they are working with
3. The children's pattern of use of HANDS, making use of the available log data
4. The teacher's experience of working with the children, generally and in the context of HANDS
5. The teacher's positioning towards HANDS

Uncertainty, as a theme, threads throughout the cases, and a psychoanalytic lens based on Bion's epistemology is used to illuminate this. There is also considerable uncertainty, from my perspective as a researcher, about the cases. The meaning, particularly the emotional meaning of utterances and events is often uncertain. However, following Bion, I hope that I have been able to tolerate the uncertainty at least enough to be able to allow some plausible accounts of the teachers' experiences of uncertainty itself to arise.

5.7.1 A note on interpretation

As I discussed in Section 4.1.1, there is an ongoing debate in Social Science about what claims we can make for the truth of conclusions derived from social research methods. As I further considered in Section 4.2, applying a psychoanalytic lens, as I do in this study, adds an additional layer of complexity to the debate. In extending techniques derived from psychoanalysis from the consulting room to the research field, one particular issue is the lack of opportunity for immediate cross checking with the subject. In the analyst/analysand relationship, when the analyst makes an interpretation, the analysand gives feedback, and this ongoing dialectic between the two is an integral part of the therapeutic process, by which the analyst defines and refines his conclusions about the analysand's reality based on that crucial feedback. This dialectic process is not really possible in any truly equivalent form in a social research investigation, such as this study, based on modified infant observation technique. As such, the interpretations that I employ, based on psychoanalytic techniques, about the emotional states of the teachers and children in the case studies, should not be regarded as definitive, and are not meant to draw a full picture of the mental and emotional life of the subjects. Rather, in keeping with the overall realist position that I adopt, they should be regarded as containing certainly elements of truth, but by no means the full truth about any of the subjects involved, whose lives and experiences are inescapably more complex and nuanced than anything I or any other social researcher could hope to capture in the written word.

Further, teaching is a complex and difficult professional activity, and it is certainly not my place, as someone who is not in facing these professional challenges, to make judgements about the professional competence of the teachers in the study. Rather, the intention is to draw conclusions about the possible role of emotionality in teachers' professional experience.

6. Lynne - Getting There

6.1 Introduction

6.1.1 Background, attitude to ICTs, the FE Context

6.1.1.1 Current Role and Career Background

Lynne works as a teacher with older children (16-18) following a mainly life skills curriculum designed to develop independence. Lynne has been working at the school in various roles for 12 years and before that she worked in early years. She used to run her own nursery, and then when her children reached secondary school age, she did an HND in early year's education and then started working at Randall School as a support worker – which was around 12 years ago. After that she did a part time post-compulsory teaching qualification. Lynne previously taught predominantly at the main school site, only working at Post-16 once a week, but one year ago she took on her current post, which is as Further Education Co-coordinator, in her words "so I'm the coordinator of Post-16 rather than the teacher" and works fully at Post-16.

Lynne's background in special needs education and autism more specifically was limited before coming to Randall School. Her reported motivation for coming to work at the school was that she had a friend with a child with autism, and thought that the job at Randall School sounded interesting.

6.1.1.2 Feeling Left Out

Although Lynne is often positive about her experience of her role and working with children with Autism, she refers on a number of occasions to a feeling of isolation linked to the separate locale of the Post-16 unit. She feels that she

misses out on things going on at the main site, and that often her needs are often overlooked. She also feels that people on the main site forget about her, so that she misses out on sometimes important news and events.

6.1.1.3 Ability/Attitude to ICT in General

Lynne has a strong self-reported background in using ICT. In the initial interview she reports that “all the technology we've got at the school I know inside out.”, and observational material confirms her general fluency with ICT.

Lynne is also enthusiastic about the use of ICT in education generally. In discussing this in the first interview, she notes that the ICT facilities at Post-16 are substandard compared to the main site (another aspect of her perception of being “left out” at Post-16).

> *...Come over here and there's no interactive whiteboards and there's only six PCs. I mean we didn’t have the Internet up until last year and I do find it so difficult, really difficult and it frustrates me when they've got all that equipment at school and there are still people NOT using it because I think, 'How can you NOT?' ... technology and education now should be as important as reading and writing, shouldn't it? They should be using it and it is the way forward. These students thrive so much and progress so much more if you are using technology in the lessons. They love it and it's so visual to them and most of our students learn visually. So I think everyone should have to [laughs] ...*

Further, early on in the implementation of HANDS, this was flagged by Donald, the school’s Educational Psychologist and project coordinator for HANDS, and there was a hope that Lynne would act as a “guru” supporting other teachers. However, the pressures on her timetable meant that this was not possible.

6.2 Key Information Sources for Lynne

Interview and observations were undertaken with Lynne as follows:

1st Interview 7th October 2009
1st Observation 4th December 2009
2nd Observation 25th March 2010
2nd Interview 25th March 2010
3rd Observation 28th May 2010
3rd Interview 28th May 2010
4th Observation 2nd July 2010
4th Interview 2nd July 2010

6.3 Lynne's Children

Lynne has three children using HANDS, Tom, Patrick and Alan. The focus of the observations and the interviews was mainly on Tom. Although there was some observation and interview review of Patrick and Alan, this was more limited in scope, and in the analysis presented here, the emphasis is accordingly on Tom.

Tom was born in 1992, making him 17/18 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 89, a VQ of 87, and a clinical psychiatric diagnosis on entry to the School of Autism. He had no other co-morbid factors.

Tom lives at home with his parents during the week and attends the school on weekdays. Classroom observation data, teacher, child and parent interviews, informal visits to the school and the baseline dataset form initial impressions of Tom, in the school environment, as a generally polite and reasonably intelligent young man. He is good at using technology, likes using it in his free time, and is able to pick things up quickly. He is well liked by other students and often friendly and sociable with classmates. Academically Lynne places him at a low

grade GCSE for English and Maths. His communication skills are well developed and he can hold mature and sensible conversations. Due to difficulties in representing and planning time, Tom struggles to organise himself and finds it difficult to do things like getting ready for lunch, transitions between lessons and packing a packed lunchbox in the morning. He also finds it hard to discuss and understand his feelings and emotions. He also tends, according to reports by Lynne, independently of issues of lack of sleep, to be typically quite lethargic and unmotivated – typified by a "I don't really know" attitude.
Tom also finds it difficult to recognize problems. This is particularly striking in the case of going to bed. I observed Tom several times as being very tired/lethargic – yawning frequently, and finding it hard to focus. This is linked, by a report from Lynne and my observation of direct questioning of him by Lynne, to the fact that he refuses to go to bed at a reasonable time. This is also a matter of some concern to his parents, which Lynne has been in communication with them about. Lynne notes that Tom doesn't, as in a number of other situations, see this as a problem – i.e. in his own terms he is happy to go to bed late and be tired the next day. Lynne uses HANDS to set up interventions to remind Tom to go to bed, which fail, leading to a sense of frustration as to how to approach this problem with Tom.

Patrick was born in 1993, making him 16/17 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 77, a VQ of 65, and a clinical psychiatric diagnosis on entry to the School of Autism. He had no other co-morbid factors.

Alan was born in 1993, making him 16/17 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 87, a VQ of 95, and a clinical psychiatric diagnosis on entry to the School of Autism. He had no other co-morbid factors.

6.3.1 Tom's pattern of use of HANDS

Tom started using HANDS in November 2009. Lynne fostered his use of HANDS fairly consistently throughout the implementation period excluding the period at the start of the spring term when, due to technical reasons, the phones were removed for the children for a period of a few weeks.

6.3.1.1 Log File Analysis for Tom

Tom used the phone on 357 occasions out of a total of 1275 for Randall school, which is the most frequent use for a student at Randall School. A breakdown of his use of the phone shows that he has used the phone for the following functions:

Function	**Amount**
Appointment Create	3
Appointment Delete	1
Appointment Day View	85
Appointment Month View	14
Appointment Week View	53
Audio Skin Change	8
Interventions - Prompt Answer	1
Interventions – Prompt Ignore	22
Interventions – Prompt Postpone	1
Personal Trainer (PT)	116
Minute Watch	7
Synchronise	45
Visual Skin Change	1

Apart from synchronization, Tom has made most use of the appointment day view and the PT functions on his phone. Tom's teacher has made use of the following functions: the diary function on the phone which has Tom's lesson during the school day to help Tom to organise himself and also outside of the school day to remind Tom to go to bed in the evening. The intervention function

to remind him about bed time, and the PT function which is attached to an appointment to remind him of what to do before he goes to bed are also in evidence, corroborating other interview responses.

Tom had made generally consistent use of the phone during the implementation period.

6.3.2 Working with Tom

6.3.2.1 Uncertainty – promoting autonomy?

One aspect of uncertainty that all the teachers grapple with to greater and lesser extents is that of the resolving of their desire to promote the autonomy, and present and future independence of the children, and their concerns about the extent to which impairments due to their autism may restrict the children in being able to achieve this. This is reflected in two related data nodes from the data analysis, shown in Table 1:

Table 1 Number of source references for autonomy/capacity data nodes by teacher

	A : Restricted Capacity in Autism affects potential for autonomy	B : Teacher Aspires to Develop Autonomy
1 : Penny	3	2
2 : Lynne	3	5
3 : Kathy	6	8
4 : Mandy	5	3
6 : John	2	5

As Table 1 shows, all the teachers, at least on some occasions, indicated their aspiration to develop autonomy in the children that they were working with. Yet at the same time, they all also, at least on some occasions, indicated concerns over the effects of impairments in relation to achieving such autonomy. This is

exemplified in the following extract from the third interview with Lynne, where she discusses her anxieties about Tom's future:

> *.. I think Tom ... I don't know. He wants to stay at home with Mum and Dad and never wants to leave. Don't see the point of work ... there is no ambition there to do anything or ... I really don't know with Tom and I mean, he'll only have one more year with me after this year ... and he's been ... because of his ability he's not going to get any support when he leaves us anyway because he won't come under ... I don't know if you know how it works with adult services ... but because he hasn't got a learning disability he won't be accepted by them, so basically he won't get any help when he leaves us anyway. It's all going to be down to the parents fighting for stuff for him. Tom does worry me because I just think what is he going to do with his life? Okay, he could go out independently but he wouldn't ... he's too set in his own ways to change at all. Say if you was interviewing him and you actually said something that he didn't like he'd argue with you and get annoyed and sort of like if you're in a workplace or whatever he's not going to be able to act like that is he? But I don't know with Tom. One day ... I mean some days he comes in as bright as anything and he says, 'Can we go and do this, can we do that?' and you think, 'Oh maybe he could!' and then another day he'll sit there and he'll fall asleep!*

Lynne is conflicted about Tom. She wants to promote his independence, she has a belief on one level about what he can do and could achieve. Yet at the same time she is beset by doubts about whether there are in fact capability limitations, deriving from his autism, that will prevent him becoming independent in the future. Although she doesn't state it explicitly, it is reasonable to infer that she considers his inflexibility in thinking, "he's too set in his own ways to change at all", to be atypical, something resulting from this autism impairment. The phrasing is reminiscent of language more commonly used to describe middle aged or older adults, not a 17 year-old labile adolescent. For Lynne, it seems difficult to think of Tom as a typical adolescent boy.

This difficulty, or uncertainty, in how to think about Tom, is further illustrated in the third observation.

6.3.2.2 Tom - 8 or 18 years-old?

The third observation took place at the end of May 2010, before the summer half-term break. One of the technical issues with the implementation was that for a time the internet connection on the phones was lost, and this is a significant area of concern for Tom, which is evidenced in the material.
In this extract from Observation 3, Lynne has been reviewing the use of HANDS with Tom. Much of this has centred on an intervention that Lynne developed for HANDS, in conjunction with Tom's Dad, which is designed to remind Tom to go to bed, and so stop him being so tired during the following day. This has, up to this point, proved rather ineffective, and as becomes evident in other data, this is largely because Tom doesn't understand why he needs to go to bed earlier:

> *As Lynne starts to talk to Tom….he interrupts and starts asking when the internet is going to be put back on the phone. He has face resting on both his hands, which are close together in front of him with his elbows on the desk – his fists are tightly clenched and he has an angry expression. He looks angry as he asks about this. His voice tone is slightly winy, although generally not very expressive. Lynne stays very calm – she has her chin in her hand and one arm outstretched openly on the table in front of her. Lynne explains, in the lilting tone that I noted in previous observations, the reasons why the internet is not there. Tom continues to complain, although he gradually unclenches his fists and makes more and more eye contact with Lynne. She tells him that he will be getting the SIM card back, but that it will initially only be for phone calls and texts, not for internet. He looks very unhappy at this.*

The lilting tone is strikingly reminiscent of how primary teachers talk to 8 year-olds and atypical of how teachers talk to 17 year-old young adults. Tom's demeanour also has something "baby like" about it, and there is a certain

dependent, helpless quality in his interaction with her. However, in the immediately subsequent section of the observation there is a striking change:

> *Eventually Lynne tells him that he can discuss it with Donald (school EP and school HAND project leader) if he likes and that he will be able to discuss it with him. Tom relaxes when Lynne says this and nods; Lynne moves on, rapidly moving to discussing the calendar function and the appointments that she has set up on the phone (mirroring his timetable). I observe that Tom now has his hands on his head, and his face looks more relaxed – he seems to have cheered up a bit. Lynne moves slightly closer to him, shifting her body forward slightly in her chair. Her voice becomes more lilting in tone and she asks him to show her how to get on to the PT (Personal Trainer) activity that she has set up. Tom takes the phone, still with Lynne close in and looking over with him. He navigates the phone with the stylus quite fluently and activates the PT. He runs through the PT which has a series of images with text at the bottom, with some sounds.*

As soon as speaking to Donald is mentioned - a very adult approach to thinking about this technical issue with the technology, Tom relaxes. It is also relevant to note that Lynne moves on rapidly. On reading the transcript, my sense is of this vignette exemplifying the tension for both Lynne and Tom between his desire to be treated like an adult and his inability to act independently. It also seems as well that when Lynne "moves on rapidly" it may be that in this instance it is hard, in Bionic terms, to stick with the uncertainty, i.e. it is hard to tolerate this in many ways massive tension of not knowing, and not really being sure what to do. For Lynne, the ever present question is what can Tom really do? Is he a middle aged man stuck in the body of a teenager, unable, as Alvarez (1992) contends, to shift himself out of "stuck" ways of thinking, who has no future as an independent adult? Is he a little boy incapable or terrified of making decisions for himself, who needs adult lullabies to soothe and persuade him to do what's best for him or is he a teenager who can in fact introject a nascent adult, autonomous function, and who could even derive satisfaction from exercising that function?

This is illustrated in the immediately subsequent section of the observation:

> *Lynne asks him how he can see all the writing [if the text is too long, just the first two sentences show initially]. Tom says, looking rather unsure, "Scroll it?" Lynne takes the phone and shows him, "you just push it up like this". Tom nods in understanding – Lynne passes back the phone and he has a go himself. Lynne then moves on to adding appointments. She says that she asked Dad to show him how to add an appointment - "Dad showed you that, didn't he?" but Tom shakes his head and says "No idea". He is quite unresponsive – he just shakes his head slightly when saying this, but sounds rather uninterested – as though this is nothing to do with him.*

It's quite striking here how as soon as "Dad" is mentioned and Dad's agenda, Tom's whole attitude/demeanour, previously more engaged and interested, becomes negative, "as though this is nothing to do with him". For a short period, Tom had sustained, albeit with Lynne's facilitation, a lively autonomous interest, in this case in relation to HANDS. It seems though that the introduction of Dad's interest in the activity punctures this transient sense of independent thought and action.

It is important to note that, of course, the tension between adult and child-like states is typical of adolescence in general, as indeed are ambivalences about parental authority.

Yet for Lynne, and probably on some level for Tom as well, autism complicates things considerably. Whether because of its intrinsic effect on Tom's capability, or due to how Lynne and the school position him because of what they believe about what it means for Tom, or both, the autism diagnosis aggravates the already significant uncertainties that adolescence invokes. In particular, anxieties about whether Tom can ever really become truly adult in the future loom large.

6.3.3 Lynne's Positioning towards HANDS – magical thinking?

In the observation extracts presented, HANDS doesn't play a determining role – these extant issues about autism, capability, autonomy and independence, and relationships between teachers, parents and child are there already. However, it is certainly the case that the introduction of this new technology tool, designated as something that will help develop social and life skills, has for Lynne, activated her thinking (at least on an implicit level) about these issues, and illuminated the considerable uncertainty which they provoke.

Some aspects of this thinking as to how Lynne positions HANDS bear further scrutiny. It is in fact rather strange that Lynne would think that putting a reminder on a mobile device would make Tom want to go to bed if, as Lynne knew, he doesn't see why he should go to bed earlier. It is possible that Lynne, at least in this instance, positions HANDS from a perspective of idealization - as though this new piece of technology is going to "magically" make Tom become an adult, and in a way provide a short cut that will avoid having to grapple with all these sometimes unbearable uncertainties about him.
A similar reluctance to recognise the obvious about Tom and the going to bed reminders on HANDS is seen in the fourth observation in July, towards the end of the summer term:

> *Lynne then asks if the things she has put on, like the reminder to go to bed, whether they do help…Tom says, slightly more energetically, "Well they do help". Tom then says that when he goes to use it it's "always at low charge". Lynne has a discussion with Tom about charging the phone – she has previously told him that he should put it on charge in his bedroom when he goes to bed. Lynne goes over this, and cajoles Tom in to agreeing that he'll try and do this. I observe Tom – he yawns quite a bit, his eyes are cast down and seem to sometimes flutter almost closed – he seems quite tired. Lynne changes tack and referring to his earlier*

comment, says, "so you think some of the evening things are helping you? Tom says, with marginally more enthusiasm now than previously, "Well...sometimes they are...yeah". Lynne asks if she needs to put the "go to bed" reminder "a bit earlier now"? Tom continues to yawn. Gently, Lynne says "You're still very tired, aren't you"? With a definite tone of annoyance, Tom says quite quickly, "That's because I keep missing the phone's reminders".. Lynne says "why's that" and Tom says, "because I keep on forgetting to put it on and it's always out of batteries". Lynne says "Oh right" and then, "but if it has got batteries and it goes off then it does help..you think?" Tom says, "Yeah", without too much energy. Lynne gently cajoles Tom, asking him to try and remember to keep it charged, and then they will just think about putting the reminder back a bit, "as you are very tired, Tom".

Although on the surface this extract may indicate that Tom does feel that the going to bed reminders are serving some purpose, in the linked fourth interview, Lynne states clearly that in her opinion he was just saying that because that is what he thought she wanted to hear. Additionally she makes it explicitly clear that she realizes that Tom does not see any rationale for going to bed earlier.

Lynne:
I mean the things that have been put on them are things that have come from parents, us.... but I think with, especially with Tom, because it's what dad wanted on there and going to his sessions on time was what I wanted on there, he don't see why he's got to change anyway. It's like this going to bed earlier.

Joe:
He can't see why he needs to.

Lynne:
So he, he can't see that he's gaining anything from using it. Do you understand what I mean? If he ignores it, he can stay up later, can't he?

Joe:
Yeah.

Lynne:
So what motivation is there for him to actually take any notice of it? Because dad wants him to go to bed early.

Joe:
In the observation he did, he said that he thought that sometimes when it went off it was making a difference.

Lynne:
Mm.

Joe:
But do you think he was just ...?

Lynne:
I think he was just saying that. Yeah. Because dad's told me that, he said it hasn't.

An alternative interpretation is that in these examples, Lynne's reaction is based on counter-transference. For Tom, due perhaps as Shuttleworth (1997) puts it, to his "unusual cognitive climate", trying to think leads to very high levels of anxiety, and it is this "stuck thinking" that Lynne picks up in the counter-transference, leading to her ability to think in a flexible, adult and empathic way is hampered by her reaction to Tom's emotional state.

6.3.3.1 The Changing Capacity to Tolerate Uncertainty

However, this is only one instance and it should be noted that on a significant number of other occasions Lynne's capacity to tolerate uncertainty is much stronger in relation to both Tom, other children and HANDS. This is a theme

that is repeated within and across the cases, namely that mental states are ever shifting, even from moment to moment. As Margot Waddell puts it:

> ”Mental attitudes which appropriately belong to different stages of development, infancy, latency, adolescence, adulthood, will each, at any one moment, come under the sway of emotional forces which are characteristic of one position or the other (paranoid-schizoid and depressive), irrespective of the subject’s actual years....Such states flicker and change with the nuances of internal and external forces and relationships, forever shifting between egoistic and altruistic tendencies” (Waddell, 1998, p. 8-9)

We see what seems to be such a shift in the immediate following section of the third observation:

> *Lynne, remaining calm and unperturbed, goes on and says that she'll show it to him now then. By way of introduction she explains to Tom what she means my making an appointment - “Say you wanted to go to the Cinema on Monday....You add cinema....” She says this slightly theatrically – her eyes are expressive. Tom has the phone and follows her instructions, with an expression of concentration. Lynne reaches close over Tom as he works on the phone. She peers with him expectantly. I observe that Tom is using the on screen keyboard to type quite fluently. Tom is focused and seems engaged although his mouth is still flat and tight which to me seems to suggest annoyance (although he has had this expression through the observation). After setting up the appointment Lynne guides Tom to look at it – “Day Plan – Week – Month”. Tom asks quizzically, “do the blue dots mean that I've got appointments?” Lynne says that that's right. Tom then says, rather suddenly and in a whining tone, “when am I going to get the internet back? I've been waiting 13, 14 months for it...” Lynne glances at me and we both smile. Lynne says, very calmly and quite softly, “really, that long?” Tom then says, “will it be when they get a less expensive server?”*

Lynne ignores this and says that she will ask Donald to come in maybe that afternoon and have a chat about it with him.

Tom's somewhat transient grasp on a more adult, independent inquiring function about HANDS perhaps becomes too difficult to sustain, and he is invaded by anxieties, perhaps expressed projectively in his focus on the Internet not working. Yet here we see Lynne, who previously had seemed less able to deal with the significant uncertainties presented by thinking about concerns about Tom and his capacities in the light of his autism diagnosis, is now more able to deal with Tom's (perhaps more direct) projections, encouraging Tom to return to a more adult position by again invoking an interaction with Donald.

6.3.3.2 Lynne's Positioning towards HANDS; My Positioning towards HANDS

I have interpreted Lynne's interactions with HANDS and Tom as providing evidence that Lynne has, at least in some instances, an idealizing position towards HANDS, a feeling that in some way this new "magical" tool will allow her not to have to engage with the very difficult uncertainties involved in working with Tom.

In other instances, there was evidence that Lynne may have taken up alternative positions in relation to HANDS. In particular, during the work-study review of the second observation and interviews transcripts, colleagues commented specifically that they picked up on a considerable amount of resistance to the phone from Lynne. Further, the discussion during the session indicated that I was strongly defensive about this. This is potentially a good example of conflict for me, between my position as observer and researcher. It seems likely that at least to some extent, the emotional investment that I had in the success of the implementation meant that I was, in interpreting the material, defended against negative messages about HANDS. Moreover, as Bick (1964) indicated in her original formulations of the infant observation method, part of the function of the work/study group is to help the observer untangle issues that they may, because of their own emotional position, have not picked up. Or, more specifically in my case, to help them identify where they may have had too

strong an unconscious reaction to the material to be able to consciously judge the reality of the situation.

For example, in the interview, Lynne discusses how she had set up PT reminders for Tom to remind him to get ready for lunch; something that he found difficult to do:

> *Lynne:*
> *Well what I've done was I set it up so it was like on the appointment thing and then it was the SSI thing and then as soon as it bleeped, I mean he'd be in a lesson at twenty-past twelve, so we'd still be sitting in the lesson and then his phone would bleep to say that it was now time for him to get ready ... 'Well why do I have to get ready, no one else is getting ready?*'
>
> *Joe:*
> *Aha, right.*

Lynne then goes on to say when these reminders were implemented he was worried about being identified as different from the other children. This was not so much that he had a piece of technology which they didn't but rather that he was getting ready for lunch earlier than the others:

> *Lynne:*
> *He doesn't want to be seen as being different to everyone else but if we wait till ... say ... normally it's two minutes before lunch and we say, 'Right we'll finish now let's all go to lunch' cos, literally, the other kids will just get up, 'We're going to lunch!' Tom will need to go to the toilet and wash his hands. He washes his face and he then goes and finds his lunchbox and then he's late but that doesn't bother him ...*
>
> *Joe:*
> *Right, interesting.*
>
> *Lynne:*

But it bothers him that he has to finish the lesson before the other students to get ready.

Lynne then reports that she solved this problem by getting all the children to get ready for lunch when Tom's HANDS phone starts bleeping:

Lynne:
... but I think it's Tuesdays and Thursdays where he's in a lesson and he has to be ready for lunch, so what I've suggested is one of the lessons is mine, which is fine ... the other lesson is the other teacher ... that all the students stop when Tom's phone bleeps. So everyone stops at twenty past twelve when Tom's phone goes ... Tom can then get himself ready and basically the other students can ... we can like finish the lesson and they can go and wash their hands and whatever, so that we're already then but we're doing it at the same time as Tom. Because I think that was the issue; he had to stop the lesson and he thought he was missing out, that they were still doing something else. So that was what I suggested to Tom, which he agreed with but then the phones got taken away because of the Internet issue and everything, so that's what we're going back to after the holiday. Whether he uses it in the holiday for this bed thing I don't know, I really don't know.

My initial interpretation of this vignette before the work study group discussion was that this was an example of Lynne adopting an inclusive approach to the use of new technology. Just as a teacher might get all the classmates of a child with Down's Syndrome to use Makaton sign language, similarly here Lynne was adapting the whole classroom to fit the needs of an individual child. However, in the work study group discussion, colleagues read the observation and interview transcripts as suggesting a considerable degree of resistance to and negative feelings towards HANDS. They highlighted a number of sections from the second interview in particular, including the following extract from the start of the interview:

Lynne:
So yeah ... it was very ... I mean I spoke to Dad ... I spoke to Mum and Dad about what they would like on there but Tom is very anti-changing his routine.

Joe:
Right.

Lynne:
And I don't know whether he's going to use ... I mean, as soon as they couldn't have the Internet anymore Tom didn't want the phone anyway!

Joe:
Yeah

Lynne:
And it was like ... well there are other things we can do with it and whatever ... and I think ... I dunno, because he had that option ... if he hadn't had that option before he would probably be alright with it but because they had the Internet and he used it all the time and now it's taken away, he's sort of anti- the phone if you know what I mean.

Joe:
He did seem a bit negative there certainly, yes.

Lynne:
I mean he wouldn't have it back. Because Patrick and Alan had theirs back for two weeks after the Internet was taken off but Tom wouldn't have his back.

Joe:
Does he think ... that's what he's upset about?

Lynne:

Yes.

Although this extract is focused on Tom's perceptions, later extracts do indicate a generally negative trend in Lynne's thinking at this stage in the implementation. For example, later in the interview Lynne discusses what she thinks could be improved about HANDS:

Joe:
What did you like, what did you think was good or potentially has worked well if anything?

Lynne:
No, I mean obviously the actual phones themselves have been a bit temperamental with ... it's more the fact that one minute they've got them and then, 'Oh no, we're taking them away' and also, I was speaking with Tracy (another member of the research team) and John yesterday and I said, 'I just ...' she said ... 'There's a training session on the Wednesday after we get back after the holiday' and I said, 'Oh well, what's happening with me then?' ...

Joe:
Right.

Lynne:
... and she said, 'Oh haven't you been invited?' and I said, 'Well, no one tells me'

Joe:
They only just sorted it out yesterday...

Lynne:
But then she said, 'Oh well what I'll do is I'll do that with them and then I'll come over to you' and I said, 'No, I wanna be ... I feel as though I'm over ere on my own and ...' [said forcibly] ... Tracy does come over here but

just her and me doing it, I'm not sharing with the other teachers if you know what I mean [obviously a strongly-felt issue for Lynne] and I just think ... I have felt a bit on my own over here trying to get everything done and not included in what's going on at school. But that's not your fault or anyone's, it's just I think ... it needs to be a whole school thing rather than me over here doing it on my own and, also, Patrick's residential ... I mean the people that he's with every evening need to be included in things.

This extract illustrates a) how I am indeed significantly invested in the success of HANDS, b) how the implementation of HANDS ties in with Lynne's ongoing feelings of "being left out" and c) that it seems reasonable to conclude that at this point in the implementation, Lynne is experiencing significant frustration in relation to HANDS.

It may also be that Lynne is experiencing rivalrous feelings towards HANDS. In particular, her existing envious feelings in respect of the greater attention that staff on the main site are, in her perception, receiving may have been stimulated by the introduction of a new object. In her internal world, HANDS may be viewed as a new toy which rivalrous "siblings" (i.e. her colleagues) have been given greater access to than her. Lynne does in fact make reference to feelings of being left out in her interview responses on 8 occasions (1 in Interview 1, 6 in Interview 2, 2 in Interview 4), and it is relevant to note that these were made exclusively in respect to questions about HANDS, not her feelings about working on a different site.

It also illuminates the efficacy of the use of a modified infant observation approach to the evaluation of professional practice. In particular, the use of a work-study group to review material can usefully help the researcher or research team to separate out strong identifications which belong to the researcher from the reality of the emotional field being considered.

6.3.3.3 Varying States of Mind

Although it seems that Lynne was at times, particularly in the earlier stages of the implementation, beset by significant negative feelings, her positioning in relation to HANDS was more complex than that. On a number of occasions Lynne was indicating, either directly or indirectly, her belief that HANDS could make a difference to the young people that she was working with. Source references from Lynne were coded to the data node ”Teacher indicates belief that HANDS can promote autonomy” on 19 occasions (4 from Interview 1, 4 from Interview 2, 3 from Interview 3, 3 from Interview 4, and 5 from Observation 2).

It is also relevant to note that the technical problems involved with the implementation of HANDS are also very much present for Lynne. Although her greater level of technical ability in comparison to most of her peers does allow her to deal more fluently at times with these issues, they are still significant for her as for all the teachers. Source references for Lynne were coded to data nodes for frustration and anxiety in relation to technical problems on 8 occasions (compared to an average of 16 for all the teachers).

Thus it is reasonable to conclude that at times, Lynne has a positive orientation towards HANDS. This can usefully be considered from Waddell’s perspective on shifting states of minds. At times Lynne is subject to invasion by feelings of rivalry or intrusion due to the introduction of HANDS. At other times she was often legitimately frustrated by the technical issues involved with the implementation of HANDS. On other occasions, as with Tom in Observation 3, her anxieties related to the uncertainties involved in working with children with autism interfered with her ability to base her use of the technology on realistic thinking about the needs of the children.

Yet at other times, perhaps when she was less invaded by anxiety or uncertainty, Lynne did see the potential for the technology to make a difference to the lives of the children she was working with and was able, in a Bionic sense, to come to “know” the children. In other words, Lynne was able to

engage in a state of intersubjective relatedness, whereby she could tolerate uncertainty and anxiety and utilise her experience of working with the children to decide on how HANDS might be used.

This pattern of shifting states of mind in relation to HANDS is one that repeats itself across the other cases in this study.

7. Kathy - Live Company

7.1 Introduction

7.1.1 Background, attitude to ICTs

7.1.1.1 Current Role and Career Background

Kathy started work as a qualified teacher in mainstream secondary schools in south east London. She then worked, for thirteen years altogether, in schools for children with Emotional and Behavioural Difficulties (EBD), latterly in a borough-wide management position with responsibility for excluded and special educational needs children. Kathy then “came out of management” to work at Randall school, where she has been for the last six years. Kathy is a form tutor as well as teaching Art (her specialist area) and Religious Education (RE) across the school.

7.1.1.2 Motivation for deciding to work with children with autism

When asked, in the initial interview, why she decided to come and work specifically with children with autism, Kathy gives a bravura response:

> *Because for the last twelve, fourteen years I'd been working with the whole spectrum of Special Needs, both on the 'shop floor' and managing the organisation of the same and I decided I didn't want to be in management anymore cos my time was divided ... you couldn't be in the classroom and manage but you were expected to be so ... the needs were there ... and I was brilliant with the kids, so I thought, 'What is the condition that makes me feel really de-skilled and that was autism, so I sought a job in that cos I thought, 'Well I don't want to be de-skilled in any area'*

Here Kathy identifies disillusionment with the conflicts engendered by being in a management role as one factor in her decision to change roles. It is also evident that she saw working with children with autism as something of a challenge. In this context, how should the declamation that “I was brilliant with the kids” be considered? As a rationale, is it a somewhat unconventionally effusive, reflective analysis of her skills, or a defensive projection of invulnerability? Such uncertainty is a common thread throughout the ensuing discussion about Kathy, her thinking and her actions. There was also considerable uncertainty for me, during the analysis of the data, in making sense of what was going on for Kathy, although the review in work-study group allowed a greater sense of understanding to slowly emerge.

7.2 Key Information Sources for Kathy

1st Interview 14th October 2009
1st Observation 25th November 2009
2nd Observation 19th March 2010
2nd Interview 24th March 2010
3rd Observation 18th May (1) 2010
4th Observation 18th May (2) 2010

Supplementary:

Observation Kathy’s Class and Jill (16th June 2010)
Interview Jill (6th July 2010)

Kathy was withdrawn from involvement in HANDS directly after the third and fourth observations, and was not available for further interviews or observations. Material relevant to a consideration of Kathy and her work with the children in the context of using HANDS was derived from additional observations of Jill, a senior support worker who was regarded as holding a teacher equivalent role in the school, working with Kathy’s form class, and from an interview with Jill.

7.3 Ability/Attitude to ICT in General

Kathy initially indicates that she has a low level of ability with ICT and an agnostic or even negative attitude to technology, as in the following extract from the first interview:

> *".. because I'm not very good on computers [chuckles] I tend to still manually use a whiteboard in any subject I teach, whether it's RE, whether it's English…"*

However, later interview material indicates that Kathy's attitude to ICT is more complex, as in the following extract from later in the first interview when I ask her directly about her familiarity with using technology in the classroom:

> *Kathy:*
> *NIL! I have to use Interwrite in one of the rooms I teach RE in because there's no whiteboard, so I have to use the interactive whiteboard rather than the whiteboard I can draw on ...*
>
> *Joe:*
> *So that's slightly more than nil [laughs]*
>
> *Kathy:*
> *No! Because I can't access it myself, I have to get a class assistant to do that.*
>
> *Joe:*
> *Right*
>
> *Kathy:*

I know how to but it just keeps freezing on me. I had my first go at accessing the Interwrite by myself yesterday and I completely lost it off of the computer and had to send for someone. So I AM trying ...

Kathy's initial response is ebullient and forceful – "Nil!" Yet similarly to her declamation that she is "brilliant with the kids", there seems to be something more nuanced behind the expressed certainty. Perhaps I pick up on this tension in my response, which is tinged with laughter. Then, although Kathy initially continues to maintain her lack of ability, she actually starts relating how she is "trying" to work with and make sense of them.

The exchange then continues:

Joe:
What about at home?

Kathy:
NO! I'm keeping a twenty-one year old that's got 4 'A' Levels in ICT, why should I touch the damn thing? [laughs]

Joe:
Do you go on the Internet?

Kathy:
No, I get him to do it! [laughs] I can access the Internet, I've got no worries with mobile phones, I'm quite confident with those…..What frustrates me about the future is the level of time everything takes. Even if I had good keyboard skills, things will happen ... like I've had to learn how to design IEPs[4] and I've tried it on two computers this week and they've both frozen on me ... I've wasted forty-five minutes of my precious time messing about with this piece of technology that doesn't

[4]Individual Education Plan

work. I could have written the IEPs by then. I get cross and you can see I'm getting a bit uptight now about it but I am trying.

Joe:
Okay. Is this something that worries you ... it's something that doesn't quite fit in with how you like to do things.

Kathy:
It doesn't quite fit in. I'll access the Internet and I'll put it in my planning for the students to do research on a particular thing on the computer but I will delegate the organisation of that and people will touch the machine for me because to me it would take me so long. It summed up my frustration yesterday ... I was in a classroom. First of all the computer froze but we unlocked it and got it unfrozen ... then a symbol disappeared and that wasn't my fault and I had nothing ... I could talk to them ... we were doing RE and ... I couldn't think of any language simple enough to get my ideas across and I needed to write, I needed to draw and I had no way of doing it in that room because it was all filled with technology and I just thought ... it was fifteen minutes before I could get the lesson up and running ... I had worksheets but I'm not happy with just shoving a worksheet with someone. I'd rather explain and have the interaction going on but the technology wouldn't work. I've always got ME as a resource and I couldn't use ME as a resource and that made me even angrier and I thought, 'Damn computers'

In this extract, Kathy's legitimate frustration with the technology in her classroom comes across clearly. It echoes the importance highlighted in the literature of perceived ease of use - see discussion in section 2.9.2 above - in determining teacher acceptance of new technology.

There is also a sense of Kathy's perception that the technology gets in the way, that it prevents her teaching in the way that she wants to, and that it gets in the way between her and interaction with the children.

The last sentence from this extract "*I've always got ME as a resource and I couldn't use ME as a resource and that made me even angrier and I thought, 'Damn computers"* indicates that Kathy isn't just typically frustrated by technology. Rather, she is angry about it. It is possible that behind this anger is anxiety related to the disruptive effect of technology, which as I have previously identified in Section 1.11 above, is given some consideration in the literature (see for example, Chua et al. 1999). There could even be an element of anxiety related to fear of displacement- "I couldn't use ME as a resource", that technology will or does displace her and her role in the classroom.

7.4 Bereavement

During the 2009/10 implementation year, as reported to me by Kathy herself, Kathy's mother had a serious illness and died a few weeks before the last observation.

7.5 Approach to dealing with Autism and conflicts with the school

Kathy's approach to working with children with autism can be typified as being aligned most closely to a social model of special educational needs. Eight interview text references were coded to the data node "Children with ASD are just normal" (3 in the first interview, 4 in the second interview, 1 in the final interview), which was used to categorise responses that indicate expressed views synonymous with a conceptualisation of autism which stresses their inherent humanity and views them as having (at least partially) socially determined strengths and weaknesses, just like all children. This is exemplified for Kathy in the following extract from Interview 1:

Joe:

.....What would you say is your general approach to working with autism, how that's fits in with the school's approach overall.

Kathy:

I'm not low arousal [chuckles] for some reason that seems to work. I'll adopt the strategies that I was advise to do and I don't do that in a hypocritical way, I can see how they work or why they work ... for instance the Brain Gym, it was suggested that I do that because after the children travel into school I believe they should be allowed some time running around in the playground for some of them an hour before they came. This is NOT the rule here, so the Brain Gym was introduced to me as an alternative to me allowing them to play and, fair enough, if my class is playing then other classes might want to play. So we did the brain gym and it was quite formal and I thought, 'This Brain Gym would be wonderful if we could have some nice loud music with it and that's worked. I'm not sure the inventor of Brain Gym wanted loud music with it but it's working and is certainly motivating the ones ... they are going like 'that [demonstrates movement] and they've got a rhythm to do it to so, yes I will follow the strategies and the laid-down rules that we have to work to but if I could find a way of making it more stimulating or interesting I'll go for it and I will be very straightforward with the students. I THINK THEY ARE PEOPLE WITH AUTISM, NOT AUTISTIC PEOPLE!

Joe:

Tell me a bit more what that means, that difference?

Kathy:

When I find myself saying 'He' or 'She' is autistic, or that they're autistic I get cross with myself because I think that it's almost putting down ... there are people with autism and they have a condition, they are NOT autistic people. Cos saying they're autistic people almost sets them as a race apart and they're NOT a race apart; they are people who have

emotions and feelings, the same as the rest of us, they just have this condition ... because I've got arthritis, I'm not ... 'Oh that's an arthritic!' I'm Kathy WITH arthritis. Why can't they be students WITH autism or adults WITH autism, not autistic people?

This extract also serves to illuminate some aspects of the conflict between Kathy's and the school's approach to working with children with autism. The school employs a modified TEACCH approach (University of North Carolina, op cit), part of which is the promotion of a low arousal environment. In the extract we see that although Kathy pays lip service to the school's overall approach, it is clear that on this issue she disagrees with it.

Her consideration of her charges as being "students with autism...not autistic people" also reflects a wider conflict between Kathy's sense that the school should be promoting the children's autonomy and independence, and her perception that the school's approach is too cautious and restrictive, i.e. that they see them as autistic people, not as people with a varied range of potential. It also mirrors to some extent wider conflicts between the social and medical models of disability in relation to special educational needs.
This conflict between wishing to promote autonomy and independence and concerns over the restrictions on capability resulting from autism is exemplified here in the conflict between Kathy and the school. It is, however, a conflict that is present as a tension in the thinking of all the teacher cases presented in the study. The conflict is also present within Kathy's own thinking, as can be seen from the following extract from the second interview, when I refer to the initial observation I did with Lynne's class at Further Education. Kathy refers to two of the children, Steve and Danny, at FE, with whom she is familiar.

Joe:
Right! I did do ... I did an observation again at FE ... I went out with them to ASDA actually ... I did notice that they all ... when they got to the end of the road, they all kind of stopped and waited for the teacher or teaching assistant to come and cross over the road with them so I had a

query in my mind at that time ... you know, with seventeen year-olds, do they actually need that?

Kathy:
Steve can do. You can go to ASDA with him and he can cross the road and you can go to ASDA and say, 'Get the week's shopping for the flat Steve' and he'd do it without you being anywhere near him and Danny is meant to be a 2-to-1 ... you have to be with him because he does panic and call the Police but, equally, you can say, 'We need the week's shopping' and from memory he can do it independently but for the public safety you have got to be near him, given his size as well.

Joe:
Umm.A difficult balance to work out.

It's clear that Kathy is, inevitably, trying to work out the "difficult balance" between promoting the children's autonomy and independence, and working within the realities presented by their restricted capabilities. Although she tends to come down more on the side of the former, rationally she recognizes the imperative for practice mandated by the latter.

It seems reasonable to propose that resolving these two contrasting positions in terms of strategy selection when working with children with autism is a considerable source of uncertainty for Kathy and the other teachers in the study.

7.6 Kathy's Children

Kathy has one child, Mark, using HANDS, in her form class. Mark was born in 1996, making him 12/13 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 84, a VQ of 89, and a clinical psychiatric diagnosis on entry to the School of Autism. He has a co-morbid diagnosis of OCD.

Mark lives at home with his parents during the week and attends the school weekdays. Classroom observation data, teacher, child and parent interviews, informal visits to the school and the baseline dataset form initial impressions of Mark.

Mark presents as a pleasant, polite, but very nervous child. He is very keen to please, and both classroom observation and reports from Kathy indicate that he is unfailingly polite to adults. On several occasions when I was in the school, Mark would come up to me and say hello, and there was a strong sense of his desire to receive adult attention.

In classroom observation he frequently has a noticeable forced smile, which tends to have a manic quality to it. Kathy discusses Mark's use of this smile, and of a high voice tone, as being in response to anxiety. Other adults in the school, including Jill and Donald, the school Educational Psychologist, also comment informally on Mark's sometimes extreme nervous states. However, Mark, particularly in Kathy's presence, also has a more lively aspect to his character. He has what could be described as a flair for theatricality and humour, and this is evident in a number of observations when Kathy is working with him.

Although there is significant discussion in the interview material about Mark's autism and the significance of the diagnosis, there is no mention of the co-morbid diagnosis of OCD. There is also no reference to it in the interview with Jill, nor in informal discussion with other staff members.

Kathy comments on his playground play, indicating that despite Mark's slight frame and overall nervous disposition, he likes to engage in quite rough play on the climbing frame with older and bigger children, although she notes that this type of play does not require any talking. His day-to-day relationships with other children in the school are generally positive and over the course of the 2009/10 year he develops a friendship with Philip, who was now in his form class having previously been in another class.

Academically, Kathy places him as equivalent to “an early Level 5 in a junior school”, which implies that he is working just below his age-expected level.

7.6.1 Mark’s Pattern of Use of HANDS

Mark’s use of HANDS was rather slow to develop. Although most of the children started using HANDS in late October/November 2009, Kathy was not at that stage familiar enough with the technology to support Mark’s active use. The removal of the phones due to technical issues at the start of the spring term further delayed matters. It was not in fact really until John started giving significant support to Kathy in the technical use of HANDS from March 2010 that Mark started having sustained use of HANDS.

7.6.1.1 Log File Data Analysis for Mark

Mark used the HANDS software on the phone a total of 79 times out of 1275 for the school. This is below the average of 127.5 intervention activations on the software. A breakdown of the log file results for Mark indicate the following:

Function	Amount
Appointment Create	0
Appointment Delete	0
Appointment Day View	0
Appointment Month View	0
Appointment Week View	0
Audio Skin Change	3
Interventions - Prompt Answer	0
Interventions – Prompt Ignore	0
Interventions – Prompt Postpone	0
PT	58
Minute Watch	0
Synchronise	16

Visual Skin Change	2

Mark made most use of the PT function and limited use of any other function on the HANDS software. He had 3 PTs on helping him to think about what to say in the morning, dealing with what to do when he gets confused, and homework and 1 PT on organising homework. Mark made most use of the phone in April and May 2010. The Log File Data generally corroborates the responses on phone use given in the teacher interviews.

7.6.2 Kathy - Live Company?

In the four classroom observations Kathy comes across as an ebullient enthusiastic teacher, who injects a lot of energy into her classes, which the children on the surface appear to respond well to. There is as well, throughout the observations, an ongoing interpretative tension between events that could be considered alternatively as examples of lively engagement with the children or which might be regarded by some as examples of narcissistic or even close to uncomfortable crossing of personal and professional boundaries. Several examples of attempts to draw me out of a non-participant observer position, and the counter-transferential emotions that this invoked in me, were useful in helping to make sense of these events.

7.6.3 Crossing the Boundary with Me

In the first observation, Kathy unexpectedly and jarringly reveals personal information about her son:

> *I go in to class at 8.50 am. There are no children there, just Kathy, Diane and two other teaching assistants/practitioners – Lorraine and Kay. [Diane is Mark's key worker]. Kathy introduces me to Diane – jokingly, "This is Joe. He's the HANDS man that everyone moans about".*

Everyone says hello and seems very friendly. Kathy shows me "Amos" – her stimulus object Amos. It is a toy baby monkey that moves and gurgles to a sequence. It is very cute. Almost out of nowhere, Kathy tells me excitedly that "my son's got a girlfriend, and about how his father is very pleased with this."

In my initial annotation notes to the writing up of the observation I note:

I feel a bit taken aback by all this - I'm not clear why Kathy is sharing what could be regarded as quite an intimate matter with me - someone she hardly knows. I feel confused/uncomfortable.

This is typical of a number of instances during the observations where I also make a note of having similar feelings.

7.6.4 Working with Mark

At the time of the first interview, Kathy had been working with Mark for six weeks. She has a strong sense that in the previous years, Mark has had too much of a reliance on various supportive aids, like an angled support for use at his desk – "a half tent affair that was meant to stop him becoming anxious" – that were designed, in the eyes of previous teachers and other colleagues at the school, to reduce Mark's anxiety. Kathy's feeling seems to be that this level of intervention with Mark is unnecessary and that it is reducing his independence:

Kathy:
I haven't offered it him. He brought it in and he asked for it ... he can just pick it up and he hasn't asked for it at all this Term. His mother is very, very caring and very, very anxious and she's mentioned that he probably needs it but he hasn't asked for it. I deliberately didn't mention it to him, but I said, 'Don't you want your work station?' ... 'Oh no!'

Joe:
So was that because you thought he didn't ... he maybe didn't need to have it?

Kathy:
I didn't think either way. I just thought if he wants it he'll just say.

Kathy is clearly conscious of the difference between her approach and that of the school typically, as can be seen in this extract from later in the first interview, when Kathy is discussing what her expectations are for Mark:

I think we have to be very careful of over-nurturing. Particularly when we're at a specialist school like this. It is great ... I say I feel privileged that I have the support I do to teach the different areas of the curriculum I do but I think that is a pitfall, that where you've got people who have worked with the same students for many, many years they are doing TOO much for them.

7.6.4.1 The "Incident"

During the 2009/10 year Kathy implements her stated policy of reducing Mark's reliance on aids in the classroom. This is evident in classroom observations 1 and 2, when Kathy makes several direct references to Mark about the aids and how he is getting on fine without them. Mark apparently is getting on well under this regime, at least according to reports by Kathy, up until early May when, one week before the third and fourth observations (and a couple of weeks after Kathy's bereavement), there is an incident in which Mark "acts out" very seriously. I am not, until the end of the academic year, given any information about specifically what happened in this incident. It seems clearly, though, to have had a significant effect on the school's approach to working with Mark. During the third observation it becomes clear that a review meeting was held, which involved the senior school management and Mark's parents. As a result of this meeting, specific guidance was issued to Kathy about reintroducing

some of the aids that Mark had previously been using. It seems likely that concerns by the school management about Kathy's approach to working with Mark had been brewing for some time, and that the "incident" provoked an exertion of the school's authority.

7.6.5 Live Company?

Kathy's approach to the use of classroom aids needs to be considered in the context of her overall approach to working with Mark, which in line with her general approach to working with the class, was characterized by lively interactions.

These interactions serve to exemplify the interpretative tension created by the observational material from this case, that is to say was Kathy engaging in lively stimulating interaction which promoted the development of autonomy by her students or was she perhaps uncomfortably close to crossing boundaries and provoking their anxiety? At times the material afforded itself more closely to the former, as in the following extract from Observation 3:

> *Kathy introduced the children to an English worksheet. It has several pages. The first is on first letters and has the alphabet in sequence with a space A_____ B_____ to write a word. This is repeated underneath with upper and lowercase together Aa_____ Bb_____. Kathy is using the sheet for the children to think of words beginning with each letter and write them down. She is working more directly with Julian but frequently interjects/directs to Mark and the groups as a whole. Mark has his triangular block and a grip on his pencil. He is very smiley but seems engaged with the task, looking enthusiastically at the worksheet. Kathy starts them off by asking to different children which would come first in the dictionary – to Julian, "which will come first, Inky Snake or Bee?" to which children chorus "B". Kathy asks Phillip if he wants to use his new machine.*

Phillip says, "Noooo", and Kathy follows up with "do you need your pen grip?" and he also says No, and Kathy says, "Why does Carla (TA) think that you need your pen grip?" Phillip doesn't reply.

Kathy then asks the children to suggest words which they do for the different letters and she explains how to fill it in. She asks Mark, in reference to the bottom section if they write each letter of the word twice. Mark shakes his head vigorously and says "Noooo". Kathy then goes on to introduce the following pages. The next one is on nouns – with a picture and first letters of some of the objects in the picture. Kathy asks to the group generally, "is black a naming word?", nooooo, "is cat a naming word?", "Yes", Mark is nodding enthusiastically. Throughout this session of working, Kathy is interjecting, cajoling, suggesting – her energy seems to motivate and sustain the children's engagement.

The children now start working on the sheet. There is quiet and some fairly industrious working for a minute or so. Kathy is sitting now looking at Andy's work. She has her chin in her hands. Kathy reads from the sheet, explaining to the group, "Cover the snakes to make them fit the adjectives? can you read the words on there?....there is an exaggerated pause.."Mark!"

Mark obliges and reads "long, red, yellow, spotty, furry, sad". Kathy says "Now do it as though you were on stage", throwing her hand out theatrically and starting him off in a flourishing tone,

"LONG?"

Mark gets very animated, and says "long, red, yellow?" in a kind of quasi-American affected tone that does sound like an actor expositing on the stage. He does a flourish with his arm to accompany this. Kathy laughs and says "Well done".

Kathy, pointing to the next page, says "the next page is more difficult? you've got some sentences to finish? so adjectives – something – snake hisses, Julian?" Julian looks a bit unsure and Kathy says, "a word to describe the snake". Julian gives a response. Kathy then asks some more questions on describing words to the children, and then asks specifically to Mark, "another one Mark?" Mark says, slightly hesitantly, "Blue".. Kathy repeats, sounding pleased, "Blue? Yeah? what about a dog, what could a dog be Julian?" Julian says "Yellow". Kathy says "Yeah? a car..words to describe a car, Mark?" Mark hesitates, saying "Errrr.." and then comes up, with sounding pleased, "Striped!" Kathy says, in agreement, "a striped car? I'd like a striped car." Julian then says "a polka dot car", Kathy echoes in a surprised and enthusiastic tone, " a polka dot car!....Who knows what polka dot means?....it means spotty doesn't it? what a lovely [emphasis] word. Well done! The children then discuss briefly about sunsets – "yellow sunsets"? and Kathy says, in a pleased tone, that she didn't know her class were so clever….

The final sheet is on the past tense. Kathy introduces this and says "who can give me something in the past tense?" There is definite pause for a moment or two – none of the children react. Phillip is thinking quite hard – I have the sense that this is a challenging question for them. Then Phillip says,

"David Tennant leapt". Kathy says, "Dr.Who...yeah...that has happened". There is some more back and forth questioning on the past tense and then Kathy asks Mark if he can think of anything. Mark looks a bit blank so Kathy prompts with how about "Mark used have a high voice". Mark says "Yeah" quite agreeably and Kathy continues, "but that's past" Mark nods and seems very happy to agree. Kathy says, "What else did you used to have"? Mark thinks for a second, says, "Ur....ur..." and then has a light-bulb on look and says "used to have an insane sense of humour." Kathy and Mark laugh together and Kathy says "you've still got that".

This lively interaction shows Kathy modulating her responses effectively in reaction to the children and using her enthusiasm and energy to bring them with her. She also fosters and encourages Mark's expressive use of language and his theatrical flair, and my field notes indicate that this feels to me like a genuine interaction from Mark. His "rictus" smile is absent and there is an easier flow to his facial and bodily movements than on other occasions, when he appears tense and nervous.

In the moment when Mark theatrically says "long, red, yellow", he doesn't seem like a boy with autism, who is beset by chronic anxiety. He doesn't seem like a child with a co-morbid diagnosis of OCD. Yet he is as well all those things, but in the moment it does seem reasonable to suggest that Kathy has used her energy, as well as her belief that Mark is not defined by his labels and his anxious state, to draw him into a more genuine and creative relational state. There are echoes of Anne Alvarez's adaptation of Trevarthen's phrase "Live Company". Alvarez (1992), writing about the use of psychoanalytic psychotherapy with autistic, borderline and abused children, suggests that such children often get stuck in repetitive behavioural patterns, which although originally serving a necessary defensive function, are now just relics that prevent them reaching their potential. Alvarez proposes that the therapist needs to consider whether the child needs to be this way to deal with their own anxiety or whether, if it is just pattern behaviour, they could be challenged or enticed to consider more mindful types of communication. Alvarez's position seems to be that we should not accept autism as just "difference", but that we should be active agents in reaching across the divide and using our "live" mind to foster the reclamation of the child's mind, and by implication their agency and autonomy. With Kathy too, it seems reasonable to propose that in some instances at least she uses her live mind to cross the boundary to Mark and draw him into a more creative and alive state. Although her use of this strategy is to a significant degree based on implicit rather than explicit thinking, the end result is largely the same.

7.6.6 Crossing the Boundary

On other occasions, Kathy's interaction with the class and with Mark was, in my perception, less sure-footed.. In fact, this change in tone is seen almost immediately in the next part of the third observation:

> *Kathy then moves on to talk about the "future tense which you two (Phillip and Mark) should all be very [Emphasis] good at that as it's all about space....if I cooked yesterday what do I say?..." – children respond, "I cooked"...Kathy says, "if I cook tomorrow what do I say?"...Kathy and children chorus together, "I will...I will go to a charity shop tomorrow". There is as before back and forth discussion for a minute or so on the future tense with Kathy asking individual children what they will do tomorrow.*
>
> *Kathy asks Mark, who looks a bit blank and Kathy emphasizes, "Will will will will..." and Mark says, sounding rather pleased with himself, "I will go to HMV tomorrow and buy a Dr. Who DVD". Kathy flips her head and rolls her eyes and says, "Oh...Dr.Who..." in a mock resigned voice.*
>
> *There is more discussion on "I will" between Kathy, and the adults. Kathy says, "I will go to work tomorrow", and the adults laugh.*
>
> *After a few moments, Kathy says, in a more conversational tone, to Phillip, "will you go to church on Sunday?" Phillip shakes his head and Kathy says, "are you going off Church then?" in a slightly jokey tone. Phillip puts his head down on the desk and mumbles something. Kathy, exaggeratedly, does the same, and says in a loud voice, "Phillip, Phillip...I can't hear you". Phillip looks a bit irritated but springs up again and says, "I usually go on Saturday". Kathy asks, "What happens there on Saturday?" Phillip says, "I get bored". Kathy says, "I'm [emphasis] going to church on Saturday next term. Who with..do you know anyone else in the school who goes to church all day Saturday?" Mark says, "Steven …." in rather strangulated tone. The children's expressions at*

this indicate recognition. Kathy says that she saw his father yesterday and said, "Can I come to your church and see what happens? and that's what I'm doing...cos Steven knows more about the bible than I do".

Phillip says, "and he always says that Jesus's birthday wasn't on Christmas day, it was on another day". Kathy says "it wasn't" (with emphasis) but then says to Phillip, "if I wanted...you know you're going to church a bit...if I was your mum and really really really wanted you to go to church... and you go, (with dramatic emphasis) "I DON'T WANT TO GO"...I could say, "Phillip, you're really going to like the church service..when you get there they're going to show you lots of Dr. Who DVDs. You'd do wouldn't you?" Phillip looks pleased. Kathy continues, "and Steven's church is a bit like that...you know my reggae music. Phillip says "Uh...huh"+...well that's mostly made by black people. So when you go to Steven's church instead of all sitting there quietly, you go (in a loud voice) Ah, yeah, Praise the Lord (claps her hands)...and they'll all be dancing around and it'll be really good..and that's why he likes going to church because it's different...white people and English people go too but it is a lot of fun..." and Kathy jigs her body as though there dancing at the church. Kathy asks Mark, "Do you ever go to church?"...he looks a bit blank. Kathy prompts with, "weddings or..." and Mark says, "yeah...weddings"...Kathy says, "yeah..though so that's about the future".

Kathy then says, "OK I want to see you all working now so go!.....no rushing..best work as it's all things we have done before". The atmosphere breaks, and things become more relaxed after the intensity of the previous dialogue sequence. Mark jumps up and looks at his worksheet….

At the time of observation this sequence on church attendance made me feel rather uncomfortable. It was in professional terms unorthodox or unconventional. However, it was arguable, particularly as part of Kathy's role in

the school is to teach R.E., that she was quite reasonably taking an opportunity to explore this aspect of the curriculum with the children.

However, when this material was reviewed in the work-study group, there was agreement from professional colleagues that there had been a veering into unbounded territory. The interaction could be perceived as having a narcissistic quality to it, and Kathy seems to have lost a clear connection to the children. From a Bionic perspective, her ability to tolerate uncertainty and allow knowledge about them to emerge from intersubjective relatedness could be regared as being impaired by a flight into defensive mechanisms. It is interesting to note that Mark returns to an unusual voice tone, and that the level of engagement by both him and Phillip seems to be qualitatively different in this section of the observation.

7.6.7 Methodological Conclusions

The work study group also highlighted the usefulness of my counter-transferential response in resolving the interpretative tension inherent in this part of the observation.

The fact that I felt very uncomfortable during this section did seem to be a useful signal, suggesting that the children may also have been feeling uncomfortable, a conclusion which is supported by the observational write up. A close reading does suggest that Phillip is very uncomfortable and that Mark has no idea what Kathy was driving at, and is finding the situation anxiety-provoking. It may be that due to my prior history as a class teacher, I had something of a natural tendency to side with the teacher and a concomitant reluctance to make “negative” judgements, and that this was affecting my ability to properly make use of the available material. As in a number of other instances, taking the material to a work-study group allowed me to see past these blockages, offering, inter alia, validation that the use of a modified infant observation

approach to considering professional practice can be effective in uncovering the emotional interactions at play.

7.7 Positioning Towards HANDS

Kathy's general orientation towards technology in the first interview was characterized by a mixture of frustration and what seemed to be stronger feelings of fear and even anger. Her attitude to HANDS, at times, was in marked contrast to this.

In the first interview, in response to a question about what challenges she experienced working with children with autism, Kathy gave an answer focused on her expectations for HANDS:

Joe:
Okay. There must be ... maybe 'challenge' is the wrong word but just the kind of issues that come up ... that you have with ANY class, what are the things that ...?

Kathy:
I'm going to sound conceited but as I say, I just think that visual images, which is one of the reasons why I think the PHONE WILL WORK because it's not communicating in writing or speech. It's largely going to be ... it does have those features on it but the first thing we're going to put on there is pictures to remind them, isn't it? Because that's the way I operate anyway, being an artist ... I've never found it that difficult ... I've had to learn a lot about autism and about sequences and about the communicating and the ways to speak but as I say the visual communication thing, I just thought, 'I can do this, this is really excellent!' and if you look at recorded incidents in any room where I've been teaching there have been very few. I don't know whether I'm lucky or it's that particular talent for producing visual stuff works and I think that's why I think the phones will probably work.

Joe:
Great

Kathy:
Because it's not lists of writing which is difficult. It's not someone talking and you're not understanding their expression. The other thing that these kids relate to, along with all their peers in the outside world, is technological equipment: DS's, computers, TVs, Films like Disney and look at Thomas The Tank Engine ... if you are thinking ... Thomas in the story goes along lines doesn't he? ... sequential pictures [really interesting correlation] so yeah I think the phone's a good vehicle.

At this stage in the implementation, Kathy had attended two two-hour training sessions on the use of HANDS, but had not yet started using it regularly with Mark. She was correct in identifying the use of images, in the Personal Trainer function, as an important part of HANDS. There is also a recognition, somewhat contrasting to her earlier responses in Interview 1 on technology in general, of the importance of technology in the lives of young people. However, there is also a somewhat manic and brittle tone to what Kathy says. The question was about challenges, yet her response ignores this and she focuses on her flair with the use of visual images, and in what seems to be a partial non-sequiter exclaims that there have been very few recorded incidents in her classroom. Her enthusiasm for HANDS, given her low level of exposure to it at this stage, also seems perhaps overblown.

This perhaps overblown enthusiasm is also present in Interview 2, four months later in March 2010, when Kathy and Mark are still not fully engaged in using HANDS, partly due to a technical issue that had led to the HANDS phones being withdrawn from the children for a number of weeks at the start of the spring term:

Joe:
So what do you think..what's his feeling about it; do you have a sense of what ... how he's ... does he like it, is he happy to have it?

Kathy:
Oh he'll be happy to have it.

Joe:
Yes.

Kathy:
Not just to please us ... cos he wants to please, that is his agenda in life; he wants everyone to be happy. but, no, he will actually like it and he will find it useful unlike his laptop computer, which he doesn't like.

Joe:
Why doesn't he like it?

Kathy:
He can't see the point of it, he can write perfectly well. It's boring ... can't access the Internet on it ...

Joe:
This is the one he's got in school?

Kathy:
Yeah.

Joe:
Ah!

Kathy:
So it's just for Quirk training really and, as I say, his writing is probably a year below what it would be if he was in mainstream, so I don't think there are any issues there and it's become a chore! So, no, you know, you have to remind him to get that out ... he comes in with so many aids.

When he first came here he had his tent, like this portable workstation; his wedgies; his laptop ... you know, comes in over-burdened.

Joe:
Yeah, I was going to say.

Kathy:
So something you can just put in your pocket, it's going to be brilliant!

Again, Kathy's expressed confidence in HANDS is somewhat surprising, particularly given the significant technical problems involved in the implementation up this point, and Kathy's self-confessed lack of engagement with the technology. Mark's engagement with HANDS also seemed, from my interactions with him, to be much more uncertain at that point than Kathy suggests. In the second observation, several days before this interview, I had shown Mark how to use various aspects of the HANDS software during the observation, and his orientation towards the phone had been more one of suspicion and uncertainty than enthusiasm.

Kathy's somewhat counter-intuitive expressed enthusiasm for HANDS seems to be linked in her mind to her conflict with the school over how to work with Mark. HANDS is not considered as another classroom aid, but as something that is going to be "brilliant". Yet there does not seem to be any clear rational evidence for Kathy to base such a conclusion on at this point. It may be that because HANDS has been introduced by an agency outside of the school that Kathy positions it differently from interventions for Mark introduced by the school itself. In Kleinian terms we could consider that Kathy may be engaging in splitting, projecting negatively on to the school aids, based on its association in her mind with a harsh judgmental internal object (the school management), and simultaneously projecting positively on to HANDS. This projection, however, seems to be based on magical thinking (Klein 1998[1921]) and could be regarded as having a brittle omnipotent quality to it. This new technology will be infallible and achieve miracles for Mark.

At other times, however, particularly in the third observation in May, Kathy's state of mind in relation to HANDS seems to be more realistic. In the following extract from this observation, Kathy has managed to set up some interventions for Mark and shows them to him during the class:

> *Kathy now comes back in and now asks Mark to go and get his phone. She says, as he goes to his tray, "Mark – don't panic....[gently] no rush.." She discusses with him how he is getting on with it. Kathy says to him, "you know how you keep forgetting it in your tray" Mark turns his head and looks surprised, and says, in a questioning tone, "Do I?" Kathy nods and smiles and says that she thinks he does but that "there's nothing wrong with that..it's normal". Mark says, sounding surprised, "Really?" and Kathy says, "Yeah".. Kathy talks to Mark about what is set up on the phone for him and that it now has a reminder – "it's going to make noises to make you pay attention....you're not the only one – Jeremy's the same – keeps forgetting it and how useful it can be". Kathy carries on explaining how the reminder will work and that one of the interventions on it will be "Don't Panic". Mark echoes "Don't Panic" in recognition when Kathy says this. Kathy says, you know last week we discussed – you wanted May Day, May Day, May Day, and then Don't Panic – Just Stop and Ask – well that's going on there". Mark nods and says "yeah" with a tone of recognition.*
>
> *I observe that Kathy speaks in a measured calm tone throughout this session with Mark. ". She gives Mark her full attention – she looks directly at him and leans slightly forward in her chair. He also for much of the time looks very directly back at her. Mark says "yeah….yeah…" in a slightly stressed tone in response to what Kathy is saying – again it is hard to gauge his level of actual engagement.*
>
> *Kathy says that whereas Kevin has the phone out all the time as for him it's a "fashionable", for Mark it's different.– "you're more interested in this guy than a fashionable phone*
>
> *I observe Mark starting the HANDS application and navigating the software. He uses the stylus – a bit gingerly but his general demeanour with navigating the device seems fairly fluent. Whilst he is navigating the*

phone I observe that he puts his hand behind his head, almost as though scratching to think what to do next. He also at one point, when Kathy is talking to him, gently traces the air near his face with the stylus.

Kathy then refers to the "incident" – "remember Friday when you weren't doing what you were supposed to be doing?" Mark says, sounding confused and unsure, "I was confused". Kathy says, quite confidently, "you were confused because you'd been caught I think...you knew exactly what you'd done..it was something you'd done before..it wasn't a new thing" Mark nods – he seems quite calm, and says, "I saw someone else doing it as well". Kathy says, "but the point was that you didn't know what to do with that confusion, did you?...and that's what the phone is going to help you with...it could be really useful in helping you when you get upset". Then, by way of analogy, Kathy tells Mark that sometimes she gets confused and gives an example from last week when Ruthie made some comments in her planning book. Kathy says, "I was cross...I wanted to cry...and I wanted to go home". Mark nods and says, "yeah". Kathy says, "and I didn't have a phone to say, Kathy, Don't Panic...you have...and we all feel like that".

Kathy seems to be much more in contact with Mark during this exchange, and there seems to be a more realistic evaluation of the role of the technology, now based on actual experience of using it. In Bionic terms, we could say that she has managed to stay with the uncertainty and maintain a greater degree of intersubjective contact, allowing her to "know" more about what is really going on for Mark. The "Don't Panic" intervention that Kathy has implemented on HANDS in this instance seems potentially attuned to his needs. Kathy also seems to handle the issue of the "incident" with a careful attunement to Mark's emotional state.

HANDS still plays a role in her thinking about Mark, and although it's not clear at this stage whether HANDS really can make a difference to Mark, his functional engagement with it in this observation do at least suggest that it's a possibility.

7.8 Live Company

Shortly after the third and fourth observations, Kathy went on sick leave and was simultaneously removed by the school from the project. The “incident” with Mark, happening in the context of Kathy’s recent bereavement, seems to have precipitated a change for the school, Kathy and Mark himself. Although I discussed Kathy’s abrupt withdrawal from the HANDS project with Donald, no explanation for the change was forthcoming.

Thinking about how to work best with Mark engendered considerable tension for both Kathy and the school corporately. This tension was positioned around two contrasting positions. On the one hand, Kathy felt that the use of support aids reflected a broader “nannying” attitude to Mark, which hampered his independence and was limiting his development. Kathy adopted a less structured, more energetic approach to working with Mark, which clearly at times stimulated the creative and expressive aspects of his character. On the other hand, the school seemed to have felt that the freer, less structured approach taken by Kathy, exemplified through the removal of support aids, was increasing Mark’s anxiety levels. Towards the end of the 2009/10 implementation year, the children “moved up” to their 2010/11 academic year classes and Mark moved to Penny’s class. I undertook an observation in July with Penny in which I observed her working with Mark:

> *Philip moves quickly to his place but Mark goes more measuredly to his tray, and gets his desk support and his image based paper day planner. He seems calm (calmer actually than any of the previous observations). I note his keyring of reminder phrases sticking out of his front pocket.*

The protruding keyring flags the return of the classroom aids and on this occasion Mathew is noticeably calmer in the much more structured and “low arousal” environment of Penny’s class. One also has to question, however, whether Mark also lost something when the break with Kathy occurred.

Review of the material from the third observation in the work study group was helpful in moving towards a conclusion about Kathy's work with Mark. Colleagues confirmed my sense that Kathy could be perceived as coming uncomfortably close topersonal and professional boundaries, and that she was could be regared as being on occasion narcissistic and beset by internal anxieties that reduced her ability to be in regulated emotional contact with her students. Yet there was also recognition that she was the victim of quite powerful forces from the corporate school body, forces that could considered as repressive. Given the structural power imbalances that individual teachers face when confronting whole school approaches, it is perhaps not surprising that these forces stimulated defensive reactions in Kathy, particularly in the context of the illness and death of one of her parents during this period. It was also felt important to recognize that Kathy could be thought of as having crossed boundaries that needed crossing when working with Mark and his classmates. Kathy had an explicit sense of the uncovered potential of her students that was not wholly defined or restricted by their autism diagnosis, which meant that they could be more independent in their current and future lives. This sense of developing independence may have been interwoven in Kathy's thinking with the fostering, particularly for Mark, of a sort of creative social communication exemplified in their joint engagement in theatrical flourishes. Kathy was also likely to have experienced considerable uncertainty about how to work with Mark, even if this was for the most part in the collected material covered under an omnipotent façade. In particular, the tension between Kathy's and the school's positions in respect of Mark must have led Kathy, at least on an unconscious level, to entertain doubts as to whether she was doing the right thing with him. Kathy's wild, unbounded energy may have at times been narcissistic and manic, but this may have been a reaction to the considerable external forces brought to bear on her. At the same time, this exertion of energy by Kathy, when she was in a more robust state of mind and was able to maintain a regulated emotional connection with Mark, served to create some sort of live connection with Mark, which did, at times, serve his development. It was this that he lost when the connection with Kathy was severed.

This pattern of “manic” energy and live connection can also be identified in Kathy’s positioning towards HANDS. In the second interview, Kathy’s reaction to HANDS was considered to be an example of idealization or magical thinking. There is undoubtedly an element of truth to this. However, more emphasis perhaps should be given to her reference in the first interview to the role that technology plays in the lives of the children that she was working with. It is possible to argue that Kathy saw HANDS, as an example of the “new technology”, as being a symbol of how children with autism can engage with the real world. Indeed, this was one the core principles for the overall HANDS project, namely that children with autism tend to be heavily motivated to use technology and that by using smartphones they can appear to be “just like other kids”, an idea for which there is support in the literature (see Mukuria & Obiakor 2008; Leblanc, Richardson and Burns 2009).

Kathy may have thought that engaging children with autism with this new technology was a way of fostering their autonomy and independence. Thus it wasn’t just that Kathy saw HANDS as something outside of the school’s corporate structures, but that it actively tied in with her explicit and implicit desires to place greater stress on fostering the children’s independence. This may be a more nuanced explanation for her somewhat idealized view of HANDS earlier in the project. Of course, much of her engagement with HANDS was still likely to have been driven by this “manic” energy. Thinking about HANDS meant thinking about the ongoing tension between her position and the school’s in relation to working with Mark, and would have tended to stimulate the repressed but most likely ever-present uncertainties as to whether she was in fact doing the right thing with him. Her flight at times into idealization and a kind of “manic”, magical thinking can be understood in this context. Again, when she often did maintain a more robust state of mind, Kathy was able to channel her energy constructively in to thinking about how HANDS might practically be used to help Mark.

Overall, Kathy's achievement, no doubt on many occasions, of "Live Company" for Mark was likely to have been a positive element in his development.

8. John - The Cognitive Patrician?

8.1 Introduction

8.1.1 Background, attitude to ICTs

8.1.1.1 Current Role and Career Background

John did a degree in Zoology in the UK and then went to South Africa to do research on parasitology. On returning to the UK in the early 1990s, he trained as a teacher and then worked as a Science teacher in secondary schools, but also at times as a teacher in primary schools. John initially came to Randall school on a short term supply contract and at that stage had no specific experience of special educational needs nor of autism. John has now been teaching at the school for six years. John seems to feel that there is a good fit between him and the school

> *I've been teaching here six years and when I came here it was with NO special educational needs background at all. But I came as a Supply teacher ... and I just said, 'Throw away the learnt and be prepared to come into an SEN school and I came here a couple of weeks after I said that and I've been here six years now and fitted in reasonably well I think.* [Interview 1]

John reports his motivation for wanting to come and work with children with SEN as being based on a desire to contribute to society:

> *…I don't know why I had a thinking that I'd quite like to do it? Possibly because I've got quite a lot of belief in God and things like that and I want*

to be of service to the community and not just obtaining my financial remuneration, so I suppose that's what really motivates me ... of the idea of helping.
[Interview 1]

John's main role in the school is to teach Science and Maths across the year groups. He does not have a specific form class for which he is responsible.

8.1.1.2 Coming into the Project

John was not originally scheduled to be involved as a teacher in the HANDS implementation during the 2009/10 exercise. Another teacher, Mitzi, originally started working on the project with Jeremy (the focus child using HANDS) in the autumn of 2009. Mitzi was Jeremy's form teacher.

Mitzi's motivation to be involved in the project was, however, very low, and little progress was made with Jeremy's use of HANDS. Mitzi then left the school to take up another post towards the end of the autumn term, and John was then identified by the school, partly due to his technical skills, as an appropriate teacher to take over the role of working with Jeremy on HANDS from January 2010. It is relevant to note that John did not take on the role of form teacher, and at least in the initial stages of his involvement in HANDS, his main contact with Jeremy was for a few science sessions each week. However, as his involvement in the project and his work with Jeremy developed, John spent an increasing amount of time working with Jeremy on HANDS.

8.1.1.3 Ability/Attitude to ICT in General

John has a strong background in ICT, which is confirmed by self-reports in interviews and observations. John's level of ability in ICT and enthusiasm for its use could be considered as parallel to Lynne's. In fact, during the implementation period, John takes on the lead role for the project from a technical perspective within the school, acting to some extent as a technical

resource for the other teachers, and working in liaison with teachers in other schools, and the HANDS project academic teams. This role was originally envisaged as being one that Lynne would fulfil, but due to her location “on the edge of things” in Further Education, it made more sense for John, given his ability with ICT, to step in.

8.2 Key Information Sources for John

Interview and observations were undertaken with John as follows:

1st Interview 15th February 2010
1st Observation 4th March 2010
2nd Observation 25th March 2010
2nd Interview 26th March 2010
3rd Observation 21st May 2010
3rd Interview 21st May 2010
4th Observation 25th June 2010
4th Interview 25th June 2010

8.3 John’s Positioning in the School

In the initial interviews and observations, John comes across as a committed, but often quite anxious teacher. His approach to working with the children has something of an “academic” air to it, and he often focuses on concepts, often thinking quite hard about how to get these across to the children, although not always with success. His control of the classroom is variable. Sometimes he projects his presence and authority, but at other times there is much less of a sense of authority and on several occasions the children seemed restless and somewhat unbounded with him. However, at these times John acts without rancour, and there is a sense of affection between the children and John, even when they are not always behaving very well. This sense of affection is mirrored in John’s positioning within the staff group. One of my colleagues on the general

HANDS project team, who spent a significant amount of time with all the teachers involved in HANDS, commented in early 2010, to the effect that John was very much “held” by the school. My own informal and classroom observations did also indicate that John was felt by the school to be a valued member of the team.John did, in fact, very much “fit in” with the school.

8.4 Jeremy

John worked with one child, Jeremy, who was using HANDS.

Jeremy was born in 1995, making him 14/15 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 74, a VQ of 63, and a clinical psychiatric diagnosis on entry to the school of Autism. He had no other co-morbid factors.

Jeremy lives at home with his parents during the week and attends the school on weekdays. Classroom observation data, teacher, child interviews, and informal visits and interactions at the school form initial impressions of Jeremy in the school environment as a very anxious child, who finds it difficult to deal with new situations and tends to be limited in his use of language, particularly with people with whom he is unfamiliar. Teacher reports indicate, based on parental reports, that school behaviour contrasts to that in his home environment, where he is relaxed most of the time. When he is anxious he displays a significant amount of what can be regarded as typically autistic traits, particularly repetitive behaviours and routines, and echolalia, etc.
Echolalia and repetitive pacing up and down were seen on a number of occasions during classroom observations.

Teacher reports indicate that Jeremy finds it difficult to read other peoples emotions and gets worried that people around him are unhappy

Jeremy enjoys using technology, receiving time-out on the computer as a reward for positive behaviour. He requires lots of prompting and guidance at

school and in his daily life; enacting plans or actions required for the task in class only when he is verbally prompted by his teacher or when he sees others in his peer group beginning the target behaviour.

Jeremy has a keyworker teaching assistant, Jean, who works with him for most lessons. Jeremy seems to have a relatively strong and secure attachment to her. Another assistant, Dawn, who is Jean's sister, also works with Jeremy for some lessons, and again Jeremy has a positive attachment to her.

John categorises Jeremy's ability in Maths as a high level 2 (typical level expected for a child aged 7) and in Science as a low level 2 (below the typical level expected for a child aged 7). John reported that as he does not teach Jeremy for English he is unsure about his exact ability level. However, he felt that he was able to decode well, but that often he did not properly comprehend what he had read.

In terms of social interaction, John reports that Jeremy is able to ask people things, but that often he does not even when he needs help. In observations, I do see Jeremy asking for help on a number of occasions. However, this seems to the limit of his typical interactions with adults.

When asked about his play interactions with other children, John indicates that he doesn't think that Jeremy engages in much play with other children due to anxiety, but he thinks that if Jeremy has got someone that we really knows well then he can play and interact with him.

John also maintains a strong sense of hopefulness about Jeremy, which is evident throughout all the interviews.

8.4.1 Jeremy's pattern of use of HANDS

Jeremy started using HANDS in late October 2009. However, there was little sustained effort to engage Jeremy with HANDS, until John started working with him in January 2010. From February 2010, when the phones were returned to the children after being temporarily removed due to technical problems, John was committed to promoting Jeremy's use of HANDS, and worked hard to develop interventions for him and testing them out. However, Jeremy's interest in HANDS and motivation to use it was consistently low. The general consensus between John, other teachers and the HANDS project team was that Jeremy either did not understand the objectives why he was expected to use HANDS, or did not, similarly to Tom, see these objectives as something important or relevant to him.

8.4.1.1 Log File Analysis for Jeremy

Jeremy used the phone on 158 occasions out of a total of 1275 for HA school, a relatively low level of usage. A breakdown of his use of the phone shows that he has used the phone for the following functions:

Function	**Amount**
Audio Skin Change	3
Visual Skin Change	3
Appointment Day View	17
Appointment Month View	4
Appointment Week View	2
PT	66
Synchronise	64

Excluding synchronization, the most popular functions are the PT and Appointment View. The log file view for Jeremy shows us that whilst Jeremy has made less use of appointments, they have included routine appointments for the school day and also appointments to remind him to check that he has his equipment (pencil case etc...). In March 2010 Jeremy had a PT added to the phone, which was focused on helping him with his anxiety. He has also had 3 PTs on the phone which have been aimed at helping him with various difficulties

including checking his swimming equipment, checking his daily equipment and also for using his talking key ring which helps him with remembering what to say. This is corroborated with interview responses.

8.5 John, Jeremy and HANDS

8.5.1 The Academic Patrician?

John, as with the other teachers in the study, does not have any significant prior education or training in working with children with autism. This resonates with what we know from the literature about the low level of input on special educational needs in pre-service teacher education in UK. However, John showed evidence, in contract to the other teachers, of thinking explicitly and sometimes in significant detail about theoretical aspects of autism.

John's orientation towards theoretical knowledge can be seen quite strikingly in this extract from Interview 2:

> *Joe:*
> *.....social skills, what would you say that means for children with autism?*
>
> *John:*
> *Oh I see, anything that helps them communicate with others, either understanding what someone else says or being understood themselves, I would say ... it's that situation and the thing is, is that if you can take something wrongly in what's said then an autistic person is quite likely to do that and they find it hard to bring their words to their minds ... very often they've got actually a period of time that they require to process the information and if there's just one piece of information then they're given the time to process that and they're fine but if there's a lot of things going on all at once then it's just too much for them and I suppose they do a*

'whitening out' I suppose we all do to some extent don't we? If you get too many stresses it's very difficult although I have a feeling that in our cases we often try and block out all the other things, no matter how terrible they are and concentrate on that one thing.

Joe:
That's really interesting. I mean you've been referring to ... I suppose you could call it aspects of cognitive functions or about them not having time to process it ... so is that something, that thinking, has that come from your experience or from reading or ...?

John:
Partly reading and partly through hearing the people give talks here. I did do a very small amount of psychology myself anyway. I did a basic ... I can't remember what it was called ... a basic course in Psychology at the Open University and I was going to take more with a view to doing Educational Psychology but it was just that I never realised it was too much of a climb and the wages too poor for half of that time, so I couldn't do it because I have to support a family.

Joe:
Right.

John:
So I do have some ideas about cognitive thinking and therefore I sort of understand, when someone says about the processing times, I do understand that that's a problem and you can see it in them, give them enough time [and] they'll be okay. If you try to give them one thing and then, straightaway, another thing it's too much for them. I mean I try to, when I do worksheets and things like that or choose a textbook I try to get things that do a little bit, ask them a question, do another little bit, ask them a question, rather than a whole, big passage and then ask questions.

The need for longer processing time is indeed a common cognitive concept used theoretically in relation to ASD, as part of the overall theoretical construct of impairment in executive function (see Section 3.4.2 above), and it seems clear from this extract that this is something that John is both explicitly aware of and makes use of in the development of teaching techniques. That is not to say that the other teachers are not implicitly aware of this concept. In fact the data analysis indicates that both Kathy and Mandy, on at least one occasion each, made reference to the idea of giving children more time, but there was no associated explicit consideration of this as being based on theoretical knowledge.

John's orientation towards the explicit use of theoretical knowledge can be considered to mirror, at least to some extent, his general orientation towards teaching. In several of the observations, I had a strong sense of the importance of knowledge and of knowing about things pervading John's lessons at certain times, as in the following extract from the first observation. In this lesson, John is teaching a maths lesson, focusing on sequencing, including the use of doubling:

> *There is half a minute or so of milling about and quite noisy getting ready but the children sit down quite quickly. John speaks to the TAs, directing them to work with particular children. There is chatting and getting ready going on during this. John then says in a clear voice, "Good Morning everyone" and they respond, "Good Morning John". Gradually the children focus on the lesson – John introduces the lesson objectives which are about sequencing. They are up in a list on the IWB and John reads them out, "to recognise patterns, to recognise sequences..discuss your work"*
>
> *John starts off with a doubling "warm up" and asks selected children doubling questions. At the start John tries to get some sort of "doubling" slide on the IWB but this does not appear to be working. He spends a few moments trying to get it working and says, "They all worked on our*

computer last night but not today, honestly, that's just typical" (laughing). John switches to working on the flip chart and draws up a doubling sequence. He says, showing a number added to itself, "that's all doubling is?"

I observe Jeremy. John asks Jeremy, with a warm inviting tone – and as though he's got one just right for Jeremy – "Jeremy, what is double 5?" Jeremy replies "double 5 is?..10" in a flat tone. John says "well done" in a generous tone. John goes on and asks other children doubling questions. He finishes off by pointing out to the children that "doubling is? times two" (emphasis)

John then moves on to the main part of the lesson and says, "So..we're going to do sequencing" He goes back to computer and brings up another slide, which works this time. He shows the image on the IWB which is using pictograms to show a doubling sequence – 2,4,8,16..., and says "you could have a doubling (emphasis) sequence" John goes through the pattern and the children echo with him "2,4,8, 16..". John points out the additive pattern – "4 then 4 more?....

I observe Jeremy. Jeremy focuses in and out and then gets up and walks around the back of the classroom before going back to his seat (he does this several times during the lesson, sometimes accompanied by clapping).

John then gives out a worksheet based on pictograms and identifying patterns. John initially asks the TAs to work with 2 children (Oswald and Karl) individually at the end of the table, showing the TA what the children need to do, and then draws in the rest of the group with him – "Now I'm going to do some work with you on sequences". He demonstrates different patterns on the pictogram sheet. John works with Oswald, Karl and Charlotte (TA) for a few minutes making sure that they are clear what to. The room is quieter now. John then addresses the larger group and explains to about the pictogram sheet – "you have

some shapes here, but the idea is that you're going to think of some shapes and then we'll have a look at them at the end". John then shows the sheet to Jeremy and points at a sequence with four pictograms in a square. John says, "what shape is this, Jeremy?" Jeremy says "4", John says "no...it's a bit like a square isn't it?"...John says "yes" very quickly.

The class carries on working on the worksheet – there is an industrious, "academic" atmosphere.

In my initial field notes made after this observation, I annotated this section of the observation as follows:

I have a sense when observing John of an academic tone to the session - a sense that there is something to learn, and that there is a possibility of learning it, and that learning and knowledge is something important in its own right.

Knowing about things is important to John, and he is also committed, as a teacher, to facilitating the development of knowledge in the children he is working with.

This extract also shows Jeremy exhibiting echolalia and pacing, as well as John's constructive attempts to engage Jeremy in the lesson at a level, in this case, appropriate to his needs.

8.5.2 John's thinking about knowledge, experience and intuition

I initially identified John as having a cognitive, academic aspect to him, and that in some observations, there was a sense of the importance of knowledge. It is also clear that even though he was somewhat self-deprecating about it, he had read a fair bit about autism, and used theoretical constructs from typical psychological theories about autism at times in his interview responses. This contrasted to the absence of such usages with the other teachers, apart from

Lynne. My initial impressions from observations, and from the early interviews, tended to confirm what might be characterised as a more cerebral approach. However, as happened so frequently in the study, impressions of states of mind gained in one context did not paint the whole picture. Thus I was somewhat surprised in interview 3 when John gave this nuanced response when I asked him what sources he drew on in working with children with autism:

Joe:
And what do you draw on in coming to those ways of working ... with the children ... where does that come from?

John:
It comes from the experience I've had over the years here. I guess ... not I guess, I KNOW I've had quite a bit of teaching on autism here, both informally and formally. I haven't done a huge amount of reading on it in terms of ... after a day of working here I think it's quite difficult, especially with my family, so I find it difficult just to sit down and read on autism. That may sound terrible but it's the truth. But I have an interest in it.

Joe:
But do you think it would make a difference? Do you feel that if you read loads and loads of books it would make a difference?

John:
I think if I read the right books here and there it could make a difference.

Joe:
Right.

John:
I think if I read too much what it would do is turn me into a boffin who knew this and that about autism but wouldn't necessarily have the practical knowledge on it. But the thing is ... is what I really am working from is the empathy ... yes I suppose it is empathy ... I was just looking at

you to see whether it was sympathy or empathy but we all have difficulty learning certain things and we all have times that we find that we're barraged by too many things all at once and it's overload ... and to allow empathy to guide to some extent is quite a useful thing.

Joe:
What do you mean ... what does that mean ...?

John:
It means that I'm trying to put myself into their place; I'm trying to think how THEY would think in order to see how they would react and that allows me to think ... 'I give such and such will they enjoy it, will they do it ...?' etc. etc ... 'How will they be able to tackle it ... is there too much writing for them?' In many cases the students will reject the work if there's lots of writing but if I've made it a multiple choice option they'll go for it and things like that. So all the time trying to think ... what would make it attractive to them and how would they learn from it etc ... bearing in mind that they do have this overload of information and so on.

John is suspicious of too great an emphasis on theoretical knowledge, and gives at least equal weight to empathy. When asked to explain what he means by empathy, there is still something of a cerebral quality to it, it's about working out what format of question will work best, and there is a continuing implied reference to impairment in executive function. Yet at the same time it is about putting himself in 'their' place. There is something potentially resonant here with how Bion approaches the relationship between intersubjective experiential relationship and theory. Even if it is still perhaps, in Bion's terms, too weighted towards the theory, at least there is recognition of the importance of the intersubjective relationship to the human other.

We return to this theme of the relationship between theoretical knowledge about autism, empathy and professional practice in the final interview:

Joe:

I just wanted to come back briefly to ask, we talked previously quite a bit about your view of autism and working with children with autism and you talked about a bit about it in this interview. You said in the last unit you were working from, in your day to day working with them that you were working more from empathy from, you used the phrase of "being a boffin" in a theoretical based knowledge although you said that was also something that could be useful. I just wondered if you might say a bit more about when you said about working from empathy what that meant?

John:

Yes, I mean I don't mean to say I've got no knowledge of autism, I am sure I've got quite a lot although I haven't formally gone and taken a qualification in autism, so..

Joe:

I mean that was my interpretation, the understanding I had was you thought the subject, the theoretical knowledge was important and could be beneficial but it wasn't as important as the ability to be working from empathy with the children.

John:

Yes, I think that's probably true and in fact I think in some cases some people have got very good theoretical knowledge but can't properly empathise with the students. I mention no names at all but that can happen and if you've got the theoretical knowledge, I know that it can be a good background for practice as well, I know that from my other disciplines and good theoretical knowledge normally gives good practice but it doesn't have to, it depends whether the person is applying it or not.

Joe:

So you were saying about empathy, can you say a bit more about that?

John:

Well to understand that you have problems in your own life that you try to solve and they have got problems and they are trying to solve them. I do think that I have some past history which makes me think that maybe there were traits in my life of it, I don't think I am autistic but I think I might have had the odd trait, for example when I was a young adult people said "why do you stare when you talk" and I realised I was going, staring at the person and not giving normal eye contact and at that time, and I can't remember whether they taught me or where I learnt it but I learnt that people normally look in the eyes and look at the mouth, look at the eyes and look at the mouth, and I actually sort of re-taught myself, I am not sure whether I untaught myself the natural, that's possible because I went through a phase where I was interested in staring for a point, for the sake of it, teenagers go through daft things and so on, and I might have taught myself to stare too much, I have a feeling I did, from reading something or other. And then so I found myself however sort of teaching myself, you know to look at the person's eyes and look at their mouth and not to go sort of staring at them all the time because of course it's actually physically a challenge, not physically, mentally a challenge if I stare in their face and so on. Also I think I tended, at that same time I tended to move up to the person too close. So I was in their personal bubble. But then of course I probably am not autistic because I can appreciate the idea of personal bubble and so on, it was just somehow I hadn't learnt those things so what I am saying though is we can make those sort of social errors and so on and of course they have got this problem which makes them even harder to socialise and think creatively and makes them, information come at you in a way which is bewildering sometimes to us but is constantly bewildering to them. And from knowing where we get stressed and it is overpowering gives me the empathy I think to understand them a bit. I think it's empathy as opposed to sympathy there, we do sort of, have the same sort of things, we just, not at the same level.

Joe:

I am just wondering how that plays out in the classroom or when you are working with them?

John:

Oh that's a big question, I don't know, I have not thought about it so I don't know where it plays in that sense. It does in terms of my communication, because you learn after a while not to speak too much or to try and limit your words and if I speak to someone here one of the students, I'll probably give a command in almost a euro speak sort of way, in a pottered thing with less of the articles in it and just more of the actual subject and noun, so it has an effect on that, it has an effect on work I produce for them to use, always trying to make something simple, trying to make it so it's visually pleasing, visually comforts rather than alarms I don't want to see a dogs dinner, I mean I would be fine with that but an autistic person could well freak at seeing something like that. You know it's the same sort of feeling going into an exam, a maths exam and thinking [gesture] the questions, you know, and a bit later we actually draw a breath and we look at it closer and we see it's not such a problem. I suppose they are always going [gesture] in their lives. Does it cause me to other things, I am sure it does, I am sure it causes me to do a lot of thinking about what are the pitfalls in something that I wouldn't otherwise think of.

Joe:

It sounds to me that you are saying like your, you know your self awareness, how maybe some things, at one time they are difficult for you kind of helps you in understanding how things can be difficult for them.

John:

Yes, I think it does, I think also I have some theoretical advantage on that, not from autistic study, not studying autism itself so much as studying a little bit of psychology and in terms of recall and you've got recall and recognition, a difference between recognition and recall, how much harder recall is than recognition for example, so that, you know

realising that quite a number of them have that problem of recall makes me put things in multiple choice style rather than get them to think it out straight from jumbled thoughts. I suppose in a sense I am supplying them with something in their minds, later on they might put it in the right way but initially they have it down in front of them and the choice of the GCSE science papers that I take for them, you've got a choice at the moment between totally multiple choice and totally written and I take the totally multiple choice options for them because I think that much better for them. Also in terms of the psychology I did, had things about attention, you know if you've got more than one source of information coming to you at once what do you tune out, do you hold the other while you partially attending to it or you know does it get ignored completely and I understand that as well from the psychology. And that of course has an influence on knowing what they are like. I think, this is how I see it, that they find it hard to attend to more than one thing at a time. We, when we attend to things were attend to this, we keep an ear out as it were to what's going on around us and we sometimes tend to one or two or three things at the same time and I don't think that they do, I think because of the confusion of things that they have to keep to the one thing otherwise they are going to lose track of what on earth they are doing at all.

Joe:
Interesting.

John:
I hope I've conceived them properly.

John is certainly not autistic, but it does seem plausible that his experiences as a teenager of not matching to social conventions in some instances have given him an experience of what it feels like not to fit in, that he has drawn on in working with the children, and which may even be a significant aspect of his motivation to be at the school.

This lengthy extract seems to have an oscillatory or jumpy quality to it. One the one hand, John seems to be suggesting that he is drawing on his experiences in relating to the children and getting in to their shoes. On the other hand, there is considerable discussion of psychology. The two aspects are oscillatory in that there doesn't seem to be a smooth connection between them. Interestingly John talks about attention from a psychological perspective:

> *… you know if you've got more than one source of information coming to you at once what do you tune out, do you hold the other while you partially attending to it or, you know, does it get ignored completely*

This, in a sense, is the question posed to caring professionals by Bion, and this extract seems to indicate the tension experienced by John in achieving this partial attention to intersubjective relationship, which perhaps is hard for him in any event, at the same time as making use of theory. This tension is quite possibly exacerbated by the difficulties experienced by the children he is working with in making connections between concepts. John may feel under an unconscious pressure to help them to repair these connections, or to maintain them for them, and this may be easier, given his internal dispositions, for him to focus on, than the more challenging task of engaging with them intersubjectively.

We can see this tension being played out in the context of the positioning of John and HANDS, and concurrently in the relationship between John and Jean (Jeremy's key worker assistant), Jeremy and HANDS.

8.6 John and HANDS

John's overt positioning towards HANDS is positive. He is generally enthusiastic about technology, and throughout his involvement in the implementation of HANDS, John is keen to help, to support, and promote the use of the

technology both with Jeremy and with his colleagues. In fact, informal discussions with Donald, the Educational Psychologist and Senior Management Team member responsible for running the HANDS project, indicated that the school management saw this as an opportunity for John to have an opportunity to experience having a leadership and mentoring role within the school. Yet concurrently, there were indications that at least at times, being involved in HANDS, and in particular being "under the microscope" by myself and colleague researchers caused significant anxiety.

8.6.1 A rabbit in the headlights

Observation 4 with John was reviewed in the work-study group. In this observation, John is teaching a Maths lesson to Jeremy's form group. As planned in advance, John and Jean work with Jeremy on using HANDS, introducing an intervention that is designed to help Jeremy engage in responsive conversation, something that he finds difficult to achieve. At the end of the observation, in an aside to me, John describes Jeremy as being like "a rabbit caught in the headlights", meaning that Jeremy found using HANDS and/or being observed using HANDS as anxiety provoking. Before the work-study group I had taken that statement at face value, and had generally interpreted John's relationship to HANDS as being positive. During the work-study review I introduced John as a teacher, as indicated above, who had, in my perception, sometimes significant difficulties with behaviour management. After this I said to the group that I felt very disloyal in giving this picture to John, as I had by then been working with him quite closely for a significant period. The group discussion allowed a space to reflect on these feelings and it became apparent to me that both my loyalty to John, and my loyalty and investment to the HANDS project had "blinded" me to the likelihood, picked up more obviously from the material by my colleagues, that John did in fact on one level find HANDS to be anxiety provoking.

8.6.2 John, Jean and HANDS

Observation 4 is a lesson on maps and co-ordinates. At the start of the lesson, as I come in to the class, John tells me that his wife and children were sick over the weekend so he is feeling quite tired. After that, Jeremy, who had gone to get his HANDS phone from the office where it was supposedly charging up, comes back in to the classroom. At the start of the lesson, John is quite jumpy and anxious. It is likely that this anxiety relates to being observed by me, but also to what seems to be a significant level of uncertainty and linked anxiety about how to use HANDS with Jeremy.

The lesson then starts properly with John demonstrating finding a coordinate position on a map on the interactive whiteboard. The boys are fairly attentive, and there is some good natured calling out and joking between John, Jean, two other TAs and the boys during the demonstration as in this extract:

> *One of the icons is a Pub and there is some good natured joking about this. John says, jokingly to the children, as he places it, "that's where you go to have a drink". There is a general laughing, "Oooo..." sound from the children. The TAs laugh as well.*
>
> *John finishes the introduction, still sitting at the PC, turning round and saying in a loud, confident voice,*
>
> *"I want you to do that", smiling and pointing his fingers up (a bit like a double Churchill V sign). John then moves on to showing them a follow up activity – an internet based, more complex coordinates based map. He spends a minute or so locating this, and shows them how to access it on the computer –*
>
> *"I'd like you to click on the hyperdrink". He laughs, comfortably, and says jokingly, "that's because of all that about a public house before...hyperlink...click on the hyperlink" One of the TAs says, jokingly, "Drink Up..Drink Up".... John clicks on the link and shows the class the*

map, which has some relief contours and looks more complex than the previous one. John says, as he is showing it, as an aside to the adults,

"It might be a bridge too far". Jean interjects, "Let's see how they get on with the first one". John nods, seeming for a moment slightly unsure, and then saying more confidently, "I'll help you boys with it", generally to the class.

In my contemporaneous write up of the observation, I note in relation to this:

I have a sense of the class – the children and TAs – almost holding John – being understanding of his "eccentricities" and perhaps sometimes perceived lack of authority. I might extend this to the school as a whole. I remember, when John was initially involved in the project 4 or 5 months ago, and was clearly stressed at the time by the additional responsibility (which he had not had any time allocation for at that point), that Tamar (my fellow researcher on general HANDS project), had said, based perhaps on his perceived lack of ability in her eyes, "I think they look after him really well though"

It is relevant to note that Jean seems to have a more accurate estimation of the ability level of the children, and his hesitation suggests that he is happy to defer to her evaluation of the situation. This is, on one level, entirely reasonable, as Jean as TA works with this group all the time, whereas John only has them a few times a week. At the same time, however, it is also suggests that in this instance John doesn't quite find the range of the children – that, despite his detailed responses about thinking about their needs, he doesn't quite get on the right level. The contrast to Mandy's case later on, in particular, is quite instructive.

There does seem to be something of a pattern here for John, not just this isolated incident. This is evidenced by the fact that the data node, "Could be Closer to the Action", used to denote instances where the teacher seems not to have gauged the needs of the children, had four text references from four

separate sources for John. Seven text references from three sources for Kathy were also coded to this data node, but none for other teachers.

The next extract is from around half way through the lesson, and the children are now working, semi-independently on completing a worksheet which involves finding coordinates on their own map. John now moves to working with Jeremy on HANDS:

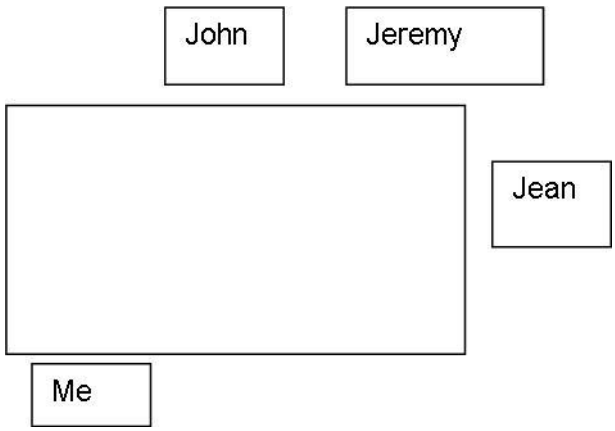
> *John now goes over to the other side of the classroom to where the phone was charging (it is around 10.15) and gets the phone and stands behind Jeremy, tapping it, frowning and muttering, "..enough charge?..."*
>
> *Jeremy turns round and shows John his sheet, standing up, and John looks at him, with their backs to me. Jeremy looks over attentively at the sheet with John – "C6...good...C8...yes.." and so on and then, "Well done, Jeremy". He then says, "Now Jeremy, I would like to spend 5 minutes talking..." He doesn't finish but nods at the phone which he has given to Jean who is sitting down at the table. Jeremy seems markedly stressed as he says this. He starts echolalia – "say....say....say" and starts to wander about in a little circle by the table. John says, I think to me and Jean, "He's stressed already, isn't he", but Jean says, calmly and non-committedly, "He's alright". Jeremy sits down but continues with the echolalia. Jean starts the phone up and gives it to Jeremy. John stands over him and starts to explain, but the other TA sitting at the computer with Robbie behind John calls out, "What do you do here?" John interrupts and rushes over to the TA, saying something about "Primary Maths Resources" – is over there very briefly and then darts back to Jeremy. He takes the phone and apparently sets a PT running.*

It is relevant to note the difference in reaction between John and Jean. John sees what is, fairly, an overt display of echolalia, what is typically an anxiety related behaviour. Yet Jean stays calm, and is able to stay with the anxiety, which HANDS, this new technology making new demands, no doubt is

provoking in Jeremy. She can stay with it, and perhaps to some extent process it for Jeremy, and possibly also for John as well, at least for a short time.
It also seems possible that for John, the uncertainty and anxiety felt in respect to HANDS is linked to John's ongoing tension about how to work with these children, i.e. what the balance is between empathy and use of theoretical knowledge.

The observation record continues:

> *John then says, methodically, "what we're going to do Jeremy, is to know that this will help you...yeah?....you're going to talk with Jean.." Jeremy – "say...say"....John – "you're going to ask her questions". Jean confirms – "ask questions?" and John says "yes". Jean starts looking at the phone with Jeremy and says, quizzically, "The battery's low".*
>
> *I decide to move to the other end of the table as I am concerned that my presence close by may be additionally stressing Jeremy. We sit like this:*



John also moves off, saying in an aside to me, that he'll let him get on with Jean so he doesn't get too stressed. Jeremy seems to be navigating the phone, as before, quite confidently and gets the idea clearly. He reads the questions that the PT prompts for in his typical monotone –

“How many brothers and sisters have you got?” “What are your favourite sweets?”
“What is your favourite TV programme?”

Jean answers the questions brightly – she smiles and seems to be enjoying it. So to the first question she says, “Dawn...Dawn’s my sister” I notice that with this question, as with the other, Jeremy doesn’t make much of a register of the answer and moves on to the next question.

However Jeremy also seems to have relaxed somewhat – he has stopped the echolalia, smiles occasionally, and seems quite focused on the phone. At the end of the sequence, the PT plays a short “Harry Hill” video. John reacts to this very positively – he moves back in his chair, smiles broadly and really seems to like it. Jean asks Jeremy if he would like to “ask questions to anyone else..to John?”

Jeremy nods. Jean signals to John, who has been hovering, and he comes and sits by him. He takes the phone and clicks through some screens. John seems a bit unsure and Jean gives John some prompts as to how to use the PT. Jeremy repeats the series of questions to John, who replies –“what’s your favourite sweet?” – John – “oh...chocolate” said in a somewhat luxuriant tone.

I note that as with Jean, Jeremy doesn’t give any follow up responses to the answers, and stays looking at the phone. Before the end of the PT, I notice Jeremy looking quizzically at the phone. John looks with him and says that it’s running slow and that it must be the battery. The reward video doesn’t seem to run this time and a bit abruptly Jean says, “are you finished?...do you want it to get charged up?”

Jean says, “Well done Jeremy...shall we let him have free time for doing well?” John says yes and nods and Jeremy gets up, leaving the phone on the table, and goes over to one of the computers. John says to me, smiling, in an aside, that he had these conversational prompts on a key

ring, but they have put them on the phone as well. John goes on and says, "he hasn't really got it in to his head that the phone is there to help him.... and that that's what I was trying to do there. Jean then says to John, "we could add on to those questions, couldn't we John?"

In contrast to the earlier parts of the observation, John and Jeremy both seem much calmer and focused here, and seem to be able to work with HANDS constructively, to explore what it can be used for. It seems that Jean's previous interjection, "He's alright", had potentially, by processing at least partially the significant anxiety and uncertainty present in the session, opened up a space where they could better tolerate the no doubt ongoing uncertainty linked to HANDS, allowing them to engage in work on HANDS.

8.6.3 John as Papa-Freud to Jean's Mamma-Klein

In the work-study review of the material, colleagues noted how Jean was much calmer than John. They also suggested that it is possible to identify a male/female principle in play here, with Jean as the female containing principle creating a nurturing holding environment that facilitates Jeremy in learning. In (necessary) contrast, John is the paternal one - more cognitively based and driving. It could be argued that both functions are required if Jeremy, or children in general, are to engage in growth and learning. In a way, Bion's clinical approach can be considered as overcoming, or merging what Gabriella Mann (2002) characterizes as the psychoanalysis's "oedipal struggle between Papa-Freud and Mama-Klein, between interpreting and holding, phallus and breast, patriarchy and matriarchy" (ibid, p.74). We might also add the struggle or dialectic between knowing and not knowing and between PS <-> D. Mann writes this in relation to Bollas's work (Bollas 1999), where he suggests that discussions about theories advocating holding and those advocating interpretation are misguided, as it is impossible to have without the other. The derivation from Bion is clear. When Bion directs the analyst to work without memory or desire, the cognitive function doesn't disappear from the consulting room, but it merges, in the transformation of O, inescapably with the empathic,

intersubjective function. In Bion's epistemology and clinical guidance, both are iteratively intertwined.

In our material here, it is possible to suggest that although no one person achieved this, when John and Jean, in their professional roles, worked together, *they* intertwined holding and interpreting, empathy and cognition, which gave Jeremy the support he needed to engage with HANDS.

8.7 John and HANDS – Flight in to Theory

We have considered John as holding a paternal cognitive function. At the same time, we have identified the tension he seems to experience, revealed substantively from interview responses, between being empathic and using theory-based approaches to autism. Where does HANDS fit into this?

In Observation 3, this time working with Dawn, Jean's sister, John voices his "in the moment" thinking about HANDS. Observation 3 is of a maths lesson where, as in Observation 4, John makes time for Jeremy to work on HANDS. In this extract, the children are working on a shape and space task:

> *Jeremy has come back to his seat now and has started cutting out his shapes. He suddenly turns to Dawn, and in a high pitched staccato says, "Sorry Dawn"...."Sorry Dawn....Are you angry, Dawn?" He looks towards her but doesn't make eye contact. He repeats this a few times, "Angry?? angry? angry" Dawn says, soothingly, that she isn't angry at all. John, who has been watching from the front of the desk, says in an aside to me, that he wonders whether it might be possible to have emotional expression recognition characters on the phone. I feel confused for a moment and John says, "It's relevant.." and I make the connection. I say that I have seen face recognition software for children with autism and John nods and says, smiling, that maybe we could load that on the phone.*

Again we see, this time with Dawn, a maternal empathic position contrasted to a paternal cognitive position. Yet here there seems to be more of a note of dissonance between them. It is, no doubt, possible to have emotional recognition characters on HANDS, but John, with his technical understanding, probably knows that this is outside of the scope of the current project. There seems to be something of a flight in to theory and cognition, rather than an appropriate use of it. Perhaps it is easier for John to think about a technology solution which might bring certainty and regularity to Jeremy's often difficult to understand behaviour, as opposed to having to process the quite difficult feelings of anxiety and inadequacy that Jeremy is projecting in this instance.

This pattern or theme seems to surface again in the subsequent third interview, in which I ask John about his perceptions of Jeremy's behaviours, when they are working with HANDS later in the observation:

> *Joe:*
> *Right! One of the other things that I noticed. One thing that I noticed that during the lesson and also when you were working with him on the phone ... echolalia he was like ... repeating this phrase ... it sounded to me like he was saying "say...say...say".... I wasn't quite sure what it was.*
>
> *John:*
> *Yes, I'm not sure myself but I do know that he has quite a number of those echolations ... is it 'echolations'? ... acca ...*
>
> *Joe:*
> *I don't know [laughs]*
>
> *John:*
> *Yes I think I should try and look it up. It's not a noun, it's a verb isn't it.*
>
> *Joe:*
> *What does it signify to you when he's doing that?*

John:

Well I would say it's displacement behaviour; he's doing something because he's not feeling quite comfortable. I think you might have noticed as soon as he had the instructions for the lesson he went into a little bit of a routine of his, his own, again because of displacement and the funny thing … well, not funny but the interesting thing is he could do it; he was quite good at it really wasn't he, he wasn't bad.

Joe:

Do you mean when he went to get a glass of water?

John:

Yes.

Joe:

Yes, I remember you commented on that.

John:

Yes. The glass of water and also he sat there and there was that period of not doing anything and when he was asked, 'What did he need?' he said, 'Scissors' so he sort of knew that he should be acting but he didn't want to act until he was confident. I don't know how we can get that using the phone. If we could, if we could get him sort of prompted; that might help as well. That might require him ... you can't do it by a buzzer of course but I'm just thinking if we can get him trained whereby he's looking for the prompt for him to help him ... 'What do I need?' ... 'Go get it!' ... that sort of thing you know ...

John is clearly thinking hard about Jeremy here and the presence of HANDS is also clearly a spur for his thinking more about Jeremy and his needs. Yet there is something of an arid, scientific quality at play here, which seems divorced in a sense from Jeremy.

Scientific theory and technology are linked paradigms. For many people, and quite likely for John given his background, technology represents the expression of scientific discovery and its regularized expression in the world. HANDS as a piece of technology seems to be acting, for John, as an object that sits somewhere between John and Jeremy, acting in a sense as a barrier to allow John to distance himself from a true intersubjective experience in relation to Jeremy. This seems to parallel instances of John's use of psychological theory, which at times, also seem to get in the way of John being "close enough to the action". This is, of course, a danger which John himself has clearly identified in his interview responses.

We could regard John's use of HANDS, in this instance, as being, to some extent, an example of what Bollas (1992) names a "terminal" object. Bollas describes a whole variety of object types, including transformational and terminal objects. Objects are not just people, but can be physical inanimate objects, landscapes, flora and fauna, or cultural genres, such as a type of pop music. Bollas identifies the transformation that takes place when the mother's processing of the infant's projections results in a developing experience of the self. On an unconscious level, the self continues to seek out objects that will also facilitate ongoing transformations, making use of its "idiom" into the object world (ibid, pp.59-65). Healthy individuals will express this desire by making creative use of music, painting, novels etc., as transformational objects. A terminal object, in contrast, "...ends the self's disseminative movement. It ends the natural forward movement of those departing trains of thought that are the elaboration of any person's idiomatic experience of life..." (Bollas, 1995, p.75, as cited in Mann 2000). The use of terminal objects is dry and arid, and lacks a quality of live relatedness.

Bollas tends to use these object categories in quite a fixed way, so an object that is transformational will typically always be transformational for an individual. As such, I do not apply his use of these categories in an identical way in this study as, in fact, it seems quite clear that both John and other teachers have multiple and changing identifications to HANDS. Yet Bollas's idea of a terminal object does seem relevant to John's positioning towards HANDS, in that it there

seems to be present that same arid quality in John’s use of HANDS in this particular instance.

9. Mandy

9.1 Introduction

9.1.1 Background, attitude to ICTs

9.1.1.1 Current Role and Career Background

Mandy started out as a mainstream secondary Physical Education (P.E.) teacher, took thirteen years off to raise a family, and then went back to teaching the subject in mainstream schools, as well as some History. She also spent a short period working in a primary school. Mandy has been at Randall School for ten years, and teaches P.E. across the school, and a few years ago was given responsibility for teaching English. Mandy is a also a form teacher. Mandy indicates that she is thinking of retiring in a ”few years”.

9.1.1.2 Motivation for deciding to work with children with autism

When asked, in the initial interview, what her reasons were for coming to work at Randall School, Mandy replied:

> *Basically I was getting old and they don't like older P.E. teachers and young P.E. teachers are cheap and I was doing maternity cover; six months here, six months there. It was continuous because I must have been doing a decent job and my name went around. The last school I went into had a very good Special Needs Department and I spent two or three weeks in there AFTER my maternity cover had finished and somebody there said, 'There's a job going at Randall, do you know anything about autistic children?' ... I said, 'Not a thing' ... she said, 'Well 'so-and-so' is autistic!' and I followed this child around for a couple of days and found it quite interesting so I thought, 'Well, go for it!' and then I*

got myself a full-time job ... Hooray!' ... so basically it was to get a full-time job: It wasn't that I was desperate to come into Special Needs education, I wanted a full-time job and nobody wanted an ancient P.E. teacher.

Mandy's overtly stated rationale is that nobody else wanted an older P.E. teacher. In fact, this theme of being anxious about being too old or in danger of being on the scrapheap, surfaces a few times in later interviews. However, Mandy's reply also indicates a desire, somewhat understated, to find out more. After tracking a child with autism for a few days she found it "interesting", or perhaps more than just interesting. No doubt both motivations played a part in her decision to move in to a specialist setting, and to stay there for an extended period.

9.2 Key Information Sources for Mandy

1st Interview 7th October 2009
1st Observation 26th November 2009
2nd Observation 19th March 2010
2nd Interview 27th March 2010
3rd Observation 24th May 2010
3rd Interview 28th May 2010
4th Observation 29th June 2010
4th Interview 8th July 2010

9.3 Ability/Attitude to ICT in General

Initially, in the autumn of 2009, Mandy's attitude towards technology, as well as to HANDS, comes across as generally agnostic and explicitly negative on occasion. Our initial impression of her is of a teacher of the older generation who, although they make use of technology in their wider life when they can see the benefit, doesn't see the need for technology in the classroom. As such she

might be seen as fitting the category of older teachers with a negative disposition towards technology reported in some of the literature (see for example Broady, Chan and Caputiet 2010). For example, in interview 1:

Mandy:
Technology I don't like to use in P.E and I'd rather they are active...

Joe:
Sure.

Mandy:
When I came here and yes I know it was ten years ago, they weren't particularly active. They're a darned site more active than they used to be. English yes we use the computer. I can use the computer but my skills aren't that great ... I got my son-in-law to look at that and said, 'What can I do on that Mike, you must teach me' and I haven't got round to being taught yet, apart from the fact he's put my granddaughter on the phone.

Joe:
Right! Why do you feel that was, that you haven't got round to that?

Mandy:
I haven't had time. I have nine kids in the class and I do an awful lot general things in the school and until I am actually driven I am not going to ... excuse me ... I'm not going to bother until I absolutely have to!

Joe:
Would you say that you can see a benefit ... more generally in relation to using more technology or you don't think there's a benefit?

Mandy:

Technology is great in the right place but for my teaching specifically I don't need it in P.E. not with this type of child.

Joe:
Sure.

Mandy:
I have a very, very simple mobile phone because, for me, all I need to do is phone. I'm not bothered about texting and taking photographs and things like that. Yes I have a computer at home and I use it at home.

Joe:
What do you use it for, do you mind me asking?

Mandy:
E-mails, booking holidays and things like that. Keeping in touch with my son in Australia which is most important. Generally that sort of thing but I'm not, 'Oh this is the latest thing, I must play with this and I must have this type of phone' No I will use it as a tool in a way that I feel what I need to use it for...

Joe:
Sure.

Mandy:
... and that's how I approach technology.

The initial observations and in informal exchanges Mandy displayed, in relation to HANDS, what was initially interpreted as a negative stance. For example, in the initial training session for HANDS, run by myself and my research colleagues, Mandy adopted a flippant stance that suggested that the activity was a significant inconvenience for her and that she would rather be doing something else.

This overtly negative stance continued to influence the way my research colleagues and I thought about Mandy and her relationship to technology generally and to HANDS.

However, the data actually demonstrates quite a different picture. In fact, for the data node, “Teacher Fluency and Ability with Technology”, ten text references were coded for Mandy, and nine of these were in fact positively orientated towards either general technology use or HANDS. For example, in the first observation, the children are working on developing a PowerPoint presentation about a recent football match they played in for the school assembly. Mandy asks Dougal, one of the TAs, to email it to the school principal. In the fourth observation, I observe that the day plan is put up using a word document on the interactive whiteboard. Further, as will be explored in Section 9.7 below, Mandy’s attitude to HANDS, although initially ambivalent, is seen as the implementation progresses in many ways to be positive and in fact Mandy shows probably the greatest commitment of all the teachers to working with HANDS and trying to get it to function in the service of the children she is working with.

9.4 Mandy’s Children

Mandy has two children, Kevin and Marlin, using HANDS, in her form class. Kevin was born in 1995, making him 14 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 102, a VQ of 114, and a clinical psychiatric diagnosis on entry to the School of Autism. He also had a diagnosis of epilepsy although there was no evidence of this affecting his behaviour during the implementation period. Kevin has been placed outside of his actual Year 9 age group in the year above with Mandy’s form class, making him the youngest member of this class. This placement was made, we understand, because the school felt that socially Kevin would do better with this group of slightly older children.

Marlin was born in 1994, making him 14/15 during the implementation period. He had a full IQ of 124 and a VQ of 130. He had no other co-morbid diagnoses. Although both children made use of HANDS, more of Kevin's interactions were observed, and the theoretical issues stimulated by his use were considerably more interesting. As such, the focus in the presentation of the case will be on Mandy and Kevin.

Marlin lives at home with his parents during the week and attends the school on weekdays. Kevin lives at home with mother and also attends the school on weekdays. Kevin's father died a few years ago (no more specific details on his death were indicated to me). Classroom observation data, teacher, child interviews, and informal visits and interactions at the school form initial impressions of Marlin and Kevin.

9.5 Kevin

Kevin presents on initial meeting as quite a typical teenager. He walks with something of a "teenage slouch", he dresses in quite an up-to-date teenage style, and he tends quite frequently to exhibit a form of teenage bravado, often being outspoken and sometimes tending not to follow rules too closely. He is popular amongst his classroom peers and is extremely motivated by sports, and is particularly keen on football. However, underneath the exterior, closer observation and reports from Mandy indicate that Kevin has in fact had very significant problems previously with social interaction and has very low self-confidence both socially and in relation to his academic work. Mandy indicates that he is working on entry-level in all subjects, below the level expected for his age, except for Maths, where in the summer of 2010 he starts on GCSE work. It becomes clear over the course of the implementation, via reports from Mandy and Donald, the school Educational Psychologist, that Kevin had several previous failed placements in mainstream schools. Although these reports were not in any detail, Mandy indicated that Kevin had found social interaction in mainstream schools very difficult, and at least partly found the intense social interaction required in the schools he had attended very anxiety-provoking.

Certainly close observation of Kevin during observations, and interview reports from Mandy indicated that Kevin had significant issues with social interaction that were masked by his teenage bravado. He had sporadic angry episodes and has in the past refused to take part in exams and opted out of certain classes such as Personal, Social and Health Education (PSHE).

There is an on-going uncertainty, expressed by Mandy, about whether or not Kevin does in fact have an autism diagnosis. Mandy reports that when Kevin was experiencing his very significant difficulties in mainstream settings, his mother, desperate to find a solution for him, took him to see a psychiatrist who was “giving out diagnoses like confetti”. Initial observations of Kevin also tended to raise a question as to how the autism diagnosis applied to him. One of my fellow researchers on the project, on initially meeting with and interviewing Kevin in the autumn of 2009 (in the initial phases of the HANDS project) on what he thought the HANDS software should include, independently raised the question of whether he did in fact have autism. Certainly, Kevin’s presentation as a typical teenager, with what seems to be quite advanced social interaction skills in the Randall School setting with his peers and with adults, also raised this question in my mind as well. However, it should be noted that all children at Randall School must have had a psychiatric diagnosis of autism to be admitted to the school. Further, as part of the wider HANDS project, cognitive psychology colleagues facilitated the independent application of the Autism Diagnostic Observation Schedule (Lord et al. 2000) and Autism Diagnostic Interview-Revised (Lord et al. 1994) standardised assessments, frequently used in the diagnosis of autism. Kevin’s score on these tests, as interpreted by my colleagues, indicated that his overall score on both tests was on the edge of the criteria for a clinical diagnosis of autism.

Kevin demonstrates nicely how, even for teachers working in special school settings, the existence of a diagnosis and issues about its interpretation can potentially be a source of uncertainty for them. Mandy discusses this uncertainty in relation to his diagnoses, as well as her assessment of his social functioning and possibilities for main school placement in the following extract

from Interview 3. In this, I was initially asking Mandy about her aspirations and hopes for Kevin in the future:

Joe:
Umm ... what about with Kevin? Well again, not just specifically with the phone; what things do you want...?

Mandy:
With Kevin it's acceptance of being 'here' is the main thing and possibly making the best of what he can do here (whispering ... he asked ... to move to the mainstream school? ... he really wouldn't ...)

Joe:
What do you think would happen to him?

Mandy:
He'd be excluded on Day three ... I am seeing if I can get him up to M Secondary School to do a BTec in PE because, again, he lives and breathes sport. They did have a boy once before but I think the whole education these days is so money-orientated it will be, 'Oh yes we'll have him, at so much a week!' Whether it's going to be out of our league, I don't know but I've just started enquiries up there to see what we can do with him up there and then he'll have his entree into mainstream but supervised and only three times a week. So he will be with boys on a level playing field because he CAN do sport. Theory he's going to find hard and his Mother and I have discussed this and I've discussed it with him as well. But he's prepared to give it a go if we can get him in there. So we will see.

Joe:
Okay. Assuming that he stays here and that kind of acceptance ... do you have any strategies in terms of helping him with that, with that

acceptance of where he is? I suppose it's also, presumably it's also ... an acceptance that he's got autism; is that part of it as well?

Mandy:
Umm, it's acceptance that ... he should ... one of his targets at the moment is that he should just accept praise because he doesn't do it, he doesn't accept it happily you know and boosting his confidence. According to his Mother he has very little self-confidence out of school. If you see him in the class you wouldn't think that...

Joe:
Well...

Mandy:
... it's all bravado...

Joe:
It seems like bravado but I mean it does go a little bit brittle to me as well sometimes, I can see that.

Mandy:
... yes. So we need the self-confidence ... out of school ... he's a sport's ambassador at the moment and he's had to teach, along with a couple of the others, EVERY class in the school to do something and he's been fantastic with the little kids. He can be so kind and so caring and we might well go down that route with him and make him a Sports Leader or something like that so he feels some self-worth ... that has got to be built up in him I think really. I don't think the all-exam route is for him at all. He might decide later on that, 'Yes okay, I ought to do some NVQs' or something like that when he's eighteen or nineteen possibly but I don't think GCSEs are his style at all at the moment.

In interview 2 Mandy had discussed Kevin's perception of his diagnostic label, saying that "he hates it" and that he is both very much aware of having this label of autism, and feels very self-conscious about it. Later in Interview 3, Mandy returns to this theme and we jointly reflect on whether or not he does have autism:

Mandy:
Kevin will probably wish to leave as soon as he's sixteen. Whether his Mum will be able to keep him in education or not I doubt ... he has an older Brother who's working and I'm sure that's what he's after, getting out to work as soon as he can. So that means just two years to build self-esteem in him and get him to realise HOW society works. She says he's very unsure of himself when he's out and about. I don't know if we can improve on that because he's not with us to go out and about much. If he was at the Hostel then there would be all sorts of independent skills ... presumably she's doing that sort of thing with him at home?

Joe:
So his lack of confidence and self-esteem, my understanding from what you've been saying is that it's linked to him being unsure about himself.

Mandy:
I think so.

Joe:
Do you think that's part ... of his autism being unsure about the world, or is it nothing to do with his autism?

Mandy:
I really don't know. I think a lot is linked to the death of his Father.

Joe:
When was that?

Mandy:
What, two years ago, three years ago ... gosh, how long has he been here? ... three years ago...

Joe:
Right.

Mandy:
And he was SO angry about that.

Joe:
Oh!

Mandy:
But I hear that his Father was a bit Bipolar. Perhaps Kevin has a touch of that, I don't know. But he was such an angry young man when he came to us. Having been excluded from various places and NO social skills at all. Just all ANGER, ANGER, ANGER! Even now you have to be careful how you tell him off; you can't just..'You shouldn't be doing that!' It's either got to be done quietly or jokingly because ... he considers it rejection ... I'm not a psychologist and I really don't think that deeply about them [laughs] ... I don't know.

Joe:
Umm! [pauses] But my sense from what you're saying there is that you're not ... quite sure that it's his autism or whether it's just HIM.

Mandy:
I wonder if he has autism? He has no social skills but he must have a diagnosis of it to be with us.

Joe:

Yeah. I have to tell you when ... remember Anka who was working on the Project before, when she came initially and spent a bit of time with him, her question in her mind was, 'Why is he here, is he actually ... does he fit under the category?'

Mandy:
I can remember Donald saying, when he came, 'Look you might not think this boy's autistic but he has no social skills, so he's just accepted as that and I think it was also the time that his Dad died and his Mother was at the end of her tether and it was a case of, 'We've got to get him in somewhere!' And perhaps she got the diagnosis and we were happy to accept him. It's touching wood but it's taken time ... let us hope that it continues ... we'll probably have an outburst when he comes back today [laughs]

Joe:
Oh dear. To me ... in my case ... which is very limited ... from what I've seen ... I did get a bit of a sense of him being a bit happier. When I came in last week ... before you got there actually ... they were ... I don't know what they were doing in Break, they were like playing some music in the classroom ... and when I came in he'd got two bits of tissue paper that he'd stuck in his ears and he pointed that out to me and I asked him, 'What have you got the in your ears for?' and he said, 'I don't want to listen to the music' but he was laughing about it and I thought that was quite funny.

Mandy:
He can be a bit of a clown but he doesn't know WHEN to stop. It's like the banter that starts in the classroom; he doesn't know when to stop it, which is a social skill isn't it? You know how far to take it and it's no further. But he'll just keep going.

Mandy identifies Kevin's bereavement as a possible source of his social difficulties, and flags his on-going anger at this, perhaps often sublimated into teenage bravado. There is also a sense of his lack of control and perhaps how this has at times shown up in a lack of awareness of normative social boundaries, although whether this is qualitatively different from typical adolescent boundary testing is hard to say. However, Kevin's mother's reports to Mandy about his lack of confidence when he is "out and about" do seem unusual, and resonate with classroom observations which do seem to uncover this very "brittle" side to a boy who, on the surface, seems like quite a normal teenager in many ways.

This extract also shows both Mandy's uncertainty about the diagnosis, and perhaps about its relevance, as well as her commitment nevertheless to keep thinking about him and trying to help him as much as she can.

9.5.1 Kevin's pattern of use of HANDS

Mandy experienced significant technical problems with the use of both Kevin's and Marlin's HANDS phones. In particular, there were difficulties with synchronization between the HANDS phones and the HANDS server. Later on, Kevin's phone broke down, and there was a significant gap waiting for it to be replaced. Despite this, Kevin had the opportunity to use the interventions function to try and help him with managing his behaviour at school. For example, Mandy created a prompt on the phone which reminded him at the beginning of each day of the kind of behaviour that was expected. It sought to motivate him towards this goal, with the use of images and language from the world of football. When Kevin responds to the intervention, he receives allocated reward points.

Mandy was also using the phone for a period of time as a replacement for Kevin's contact book, reminding Kevin to text his mum at the end of the day to inform her of his day at school.

Kevin has had some involvement in working with Mandy about what should go on the HANDS software. Whilst Kevin has not made very extensive use of HANDS, observation and interview data indicated that in general he was very positively disposed towards it. It seemed, at least partially, to be perceived as cutting-edge modern technology which may have been linked in his mind to adulthood and independence, as well as looking cool and up-to-date with the latest trends. Reports from Mandy also indicated that he made significant use of other phone functions, particularly text messaging, and Internet browsing, partly facilitated by linking it to his home Wi-Fi network when at home. Kevin also personalised the HANDS phone, installing, for example, a password and an Arsenal football club image in the phone's startup procedures.

9.5.1.1 Log File Data Analysis for Kevin

Kevin has used the phone a total of 117 times out of a total of 1279 for all the children at Randall. A breakdown of the log file results for Kevin indicate the following:

Function	**Amount**
Appointment Create	2
Appointment Delete	0
Appointment Day View	22
Appointment Month View	1
Appointment Week View	8
Audio Skin Change	7
Interventions - Prompt Answer	21
Interventions – Prompt Ignore	1
Interventions – Prompt Postpone	3
PT	0
Minute Watch	0
SSSI	0
Synchronise	47
Visual Skin Change	5

Excluding synchronization, the most used function is the day view and the interventions prompt answer. The pupil view for Kevin as of July 2010 showed that he had 2 currently active intervention reminders but no other functions, which corroborates the interview responses.

9.6 About Mandy

9.6.1 Mandy – the confident teacher

My feelings about Mandy during the implementation period are ambivalent to start with. Her initial apparently negative stance towards technology, and towards HANDS, made me wary. There was a perception in the autumn of 2009, in my mind and in the minds of my fellow researchers and the school management that perhaps Mandy was going to be a "problem" with HANDS. Further, on a number of occasions during interviews and observations, I had a sense of being ignored or sidelined by Mandy.

One example is shown in my field notes for the initial part of the second observation, although there are four other similar instances which are coded to the data node "Observer Stance Conflicts".

> *I go down to class and Mandy is in her office. I say good morning and she smiles and says good morning back. She says' "you're coming in for registration". I say "yes, that's right". There is a pause and then Mandy says, looking at her work on the desk, "The children will be in about 5 minutes. I have a few things to complete if you don't mind. I say "of course, you carry on".*

In my contemporaneous annotations I write:

I have a slight? sense – linked to the pause, of wanting to be accepted by Mandy and being anxious about this. The pause holds the anxiety. There is a sense of dismissal for me (although in reality wholly legitimate) in Mandy saying, "if you don't mind".

I also note in all of these five instances that Mandy is unfailingly polite, and in fact when I am in the classroom always makes a point of welcoming me. However, it is also the case that typically in these instances; Mandy did, as in the extract above, send a signal that she was short on time and only had so much time to spend with me. In my annotations to the final writing up of the extract from the second observation I note that a likely explanation for my emotional reaction to Mandy's arguably legitimate bracketing off of the time that she has to spend with me is that I was emotionally over-invested in HANDS. For me, as the person both implementing and evaluating the HANDS technology, it was very important. This may have made it difficult for me to accept at face value the perhaps more reality-based signal from Mandy that this was only one small aspect of her work. In the work-study discussion group, where we look at the fourth observation, colleagues suggested that the signal I am picking up from Mandy about her sidelining me may also be rooted in her concern about what effect my presence is having on the dynamics of the interaction between her and the children in the classroom. They considered that based on her long experience as a teacher, she is implicitly aware that these children need **all** of her attention when she is with them, and having to deal with a stranger in the classroom – whether me or HANDS, poses a danger of distracting her from that primary task. This argument seemed to me to have significant persuasive force, and the most compelling evidence for it is the observation of how Mandy does work with sustained close attention to the moment-to-moment changing needs of the children she is working with.

An illuminating example of this can be seen in the fourth observation:

I come in to the classroom a few minutes early. Mandy is not there, nor are the children but Dougal and one of the other TAs are sitting at the computer. We chat about the weather – it was raining heavily after a few

days of sunshine so I say, "It's been too hot really the last few days". After a few minutes, Mandy comes in. She says, "Morning, Joe" quite loudly and warmly, and I say "Hello Mandy". Mandy sits down at the central table and I go over and sit at the end of that table. Mandy's demeanour is bright and energetic – she seems to be in a very good mood. Then Angus comes in and Mandy says "Good Morning" to him and he says hello back. Then he comes over to where I am sitting to get his things and says, "Hello Joseph". I say hello back and smile and ask him, "Have you had a haircut?" He nods. He smiles a bit nervously. Angus then goes over to Mandy and she looks at his contact book. There seems to be an issue over missing information – I miss the first bit but is something to do with missing information – "she though I lost it but.."..Mandy interrupts him, clearly not understanding what he is trying to say and says, "Angus, Angus start again". Angus does and gives a long, list-like explanation of what had happened. It appears to be about some information on a form or piece of paper – "I put it by the printer, then my mum started looking round for it....." and in the end – "we both forgot about it". Mandy listens patiently – this list of what happened carries on for a while, and finally Mandy says that she'll give mum a ring tomorrow to sort it out.

On the face of it, an exchange not particularly worthy of comment. However, I had on several occasions been on the receiving end of long, boring monotones from Angus just like this one, which made you feel like you might as well be dead. Judging how to let Angus both get over the relevant information, and feel that he has been listened too, without taking up the whole morning, took considerable judgment on Mandy's side about when and how to intervene.

Then Steven comes in, looking out the window, and says, "Mandy we can't do the low ropes today". His voice is rather monotone and he has quite a marked American accent. Mandy puts her hands down square on the table, sits up and says, very pleasantly, and smiling broadly, "Yes you can!...you were told you were going to do low ropes whatever the weather...so I trust you've brought your dirty clothes that you don't mind

getting dirty". Steven doesn't seem sure what to say for a moment and then continues to argue the point, asking if they can do low ropes inside. Mandy says, more stridently, "of course you're not doing low ropes inside – it's an outside [stress] assault course – outdoor adventure activities happen whatever the weather, Steven. (the last part said in a softer, slightly mischievous tone). Then, more conciliatorily, "it's going to stop raining soon anyhow". At this point Steven seems to give up, and goes off, saying, in something of a non-sequitur, "Never believe the weather, people...never believe the weather".

Mandy sets clear expectations and boundaries for Steven and the rest of the class. Yet Mandy carefully modulates her tone, using humour and an expression of compromise and amelioration, "it's going to stop raining soon anyhow", which both binds Steven to her and allows him a measure of saving face. Her approach may also have served to help Steven and the rest of the class deal with latent anxiety associated with leaving the safety of the classroom. One can imagine another teacher whose responses were not so closely attuned to the emotional state of her students perhaps tipping Steven and the class over in to a heightened state of anxiety and overt rebellion.

At this point Piers comes in and Mandy says, "Good morning Piers" very effusively, then, "How are you?", smiling, and then, "Have you woken up yet?" Piers smiles back shyly.

The children continue to come in and Mandy greets and chats to them as they do. The TA next to me asks Mandy, "What did Kevin think about losing?" Mandy answers indistinctly and I ask the TA what he lost at and she says that he is very in to football and she means the England match. I say "aha" and nod. Piers then gives Mandy his Thorpe Park slip. Mandy takes it and says, in a somewhat exaggerated tone, "Great, Thorpe Park...." – she seems pleased to have received the slip though. Mandy continues talking to the children, for a good five minutes, checking on permission slips, money, PE clothes, the lunch register, intentions about the trip to Thorpe Park etc... in the same bright manner, and I notice particularly how she modulates responses in reaction to the individual

child's emotional state. For example, to Charlie in a soft undertone – I pick up "we'll have a quiet little chat later on"..then Angus, sitting opposite Mandy, says, somewhat out of nowhere, in a pained tone directly to Mandy, "my arm still hurts". Mandy, her eyes cast down a bit, mouth softer, says still brightly but calmly, "Injections do...they ache for some time"..and then more softly, "sometimes they come up as well....has it come up or is it..." Angus mumbles something in reply.

Mandy then does the register, saying good morning warmly to all the children and they respond in turn.
There is some discussion about England's poor showing in the World Cup England vs. Germany match the previous Sunday. Mandy and the children commiserate about how awful it was and Mandy says, jokingly, "in the end I gave up and went and mowed the lawn".
Mandy then introduces what they will be doing in English – they will be doing reading in different groups and she specifies who will be working with which adults (I notice at this point that the day plan is up on the IWB in a word document).
At this point Angus and Steven then have a short but quite intense argument about a reading book, which appears to be "Steven's" but which Angus has in front of him. They have a tense exchange about this. Steven says, forcefully, "it's my book and I can do what I please with it". Mandy says, pointedly, "Steven....Steven" and he glances at her. Angus says, tensely, "I'm just saying...I'm not saying you can't read it..." Mandy (tactically I feel) ignores this and says, deflecting them, "Right, can I carry on?" in a forceful but measured tone. They both look down and Mandy says, "Thank You." markedly and then goes on, in a lighter tone, to give further instructions to other children – e.g. about the music lesson coming up later for Charlie. Mandy then says, "OK..after lunch it's the low ropes for the lot of you – let's hope the rain has stopped and the sun is shining". Mandy then asks one of the TAs is she is ready and she nods and Mandy says, "Right"...

It is relevant to note that there is a huge range of complex interactions and task activities going on for Mandy in these five minutes. Although Mandy has a significantly smaller number of children here than in mainstream classes, they are children whose sense of emotional and sometimes physical integration is significantly impaired, and who are likely to be in a continuous state of potential anxiety about their ability to function in the world in terms of both social interaction and organisation. Even compared to typical teenagers, their ability to think of themselves as people growing towards adulthood and independence is for them all very much in question. Yet Mandy has the right word, the right tone of voice, the right look; she knows when to take notice and when to ignore. Mandy seems, when she is in this state of mind, to be, something like what Schön meant when he talked about "being in the groove". It also resonates with Grotstein's (op cit) interpretation of Bion's directive to be "without memory or desire". Mandy is in intersubjective relationship with the child, and something about their reality is created (transformation of O), the selected fact arises, and Mandy acts.

This pattern is repeated across the other observations. In the data node "Focus on the Kids and Relating to Them", which captures similar instances of focused attention to children's needs in the moment-to-moment experience in the classroom, there are 6 other instances from across the other observations. Reflecting on this now, it makes sense that Mandy's focus is on placing her attention on the children, an activity which no doubt takes considerable energy on her part. In this context, it seems reasonable that she considers the introduction of strangers, whether technological or human, into her classroom, as a potential source of distraction for both her and her, in the end, very needy students.

9.6.2 Thinking about children with autism

When asked about her approach to working with children with autism, Mandy refers to the school's modified TEACCH approach to working with autism (see

Section 3.8.1.1 above), but highlights structure as being the most important part of this for her, as in this extract from Interview 1:

> *Mandy:*
> *For structure ... the low arousal ... the empathy with the child and always the positive attitude, so that's the school's approach but, really for me, it's the STRUCTURE. Yes P.E. is NOT a low-arousal...*
>
> *Joe:*
> *No ... no.*
>
> *Mandy:*
> *I've always said that but the child I've just had to calm down now while he was yelling and screaming at me, I didn't say a word. I just blocked the doorway and when he'd calmed [down] we talked ... very calmly ... but it's waiting that half an hour when he's yelling and screaming at you. It's my 'free time' [laughing sarcastically]. But you need time with these kids, you really do. Yeah I think structure is the MOST important thing with these children but the school's approach is the whole ethos of the whole thing.*

Subsumed within the concept of structure, there also seems to be a stress for Mandy on giving them time. This may mean processing time, i.e. time to think through instructions or, as in this extract, time to process feelings. In the data node "They Need Time to Process", a sub node of "Teacher Conceptualization of and Attitude Towards Working with Children with Autism", there are 8 text references, six from other teachers and two from Mandy. One of these references for Mandy is from the extract shown above and the second is from Interview 4, which seems to confirm that in Mandy's thinking giving them time means both thinking and feeling time:

> *Mandy:*
> *The patience is one. Give … it's, it's not only patience to give them time to process what they're doing or what you have asked them to do, but for them also to come to terms with what you're asking them to do.*

Joe:
Mhm.

Mandy:
Erm if you take getting on the bus scenario, it's a case of well okay we'll stand there for two minutes and just wait, hoping that those who are already on the bus don't start getting agitated, rather than saying "Come on, come on" all the time. No, just wait and see what happens and sometimes that works.

However, whereas John made fairly significant references to quasi-cognitive accounts of autism in reflecting on his thinking, such use of explicit theoretical knowledge is very much absent for Mandy. In fact, it seems possible that Mandy has little interest in such theoretical knowledge per se, as is indicated in the following extract from Interview 2:

Joe:
And related to that question I wanted to ask ... I know that the children come with quite a lot of diagnostic information when they come to the school; is that something that you make use of?

Mandy:
Oh yeah! [immediate positive response] ... yes ... especially in PE because you'll have ones that don't like to be touched or ones that don't like to change or don't like the physical aspect of things ... which you can work around IF you know it. If you DON'T know it, if you haven't read all this information on them ... I mean it might even be loud noises and things like that ... if you're aware then you can treat them more as an individual APPROPRIATE to THEM ... yes, I always try and get all the information that comes in.

Joe:

What about a sub-diagnosis like you know, so they've been diagnosed with Asperger's Syndrome, is that something that you think means particular things?

Mandy:
Umm, I would assume, if they're diagnosed with Asperger's, they are more high-functioning than the rest of them, yep!

Here, Mandy shows what might be termed a functional interest in knowing about the capabilities and limitations of individual children coming in to her class. Yet her response to my question about Asperger's Syndrome indicates what might be termed an absence of theoretical knowledge. Most children at Randall school are high functioning, so it would not seem likely that an Asperger's diagnosis in itself would indicate that much about level of functioning. I felt uncomfortable when Mandy gave this answer and moved on quickly. This feeling may have been related to my concern on Mandy's behalf that she might feel embarrassed, and perhaps I was picking up on her anxiety about not knowing enough. Given my role as the HANDS expert from a university, who in the mind of the teachers might be thought to know lots about autism, it would be reasonable for Mandy to experience such anxiety. However, in interview 3 Mandy indicates that, "she is not a psychologist and doesn't think about them [sic] too deeply". Later in the same interview in a discussion about how often Mandy refers queries she has about the children to the Educational Psychology service, she reports that the last time she did so was four years ago. It does, therefore, seem reasonable to conclude that theoretical knowledge about autism is not something that Mandy places too much stress on. However, as the teacher thinking literature and Schön suggests, absence of explicit thinking does not necessarily imply lack of implicit thinking. In Mandy's own terms, perhaps she does in fact think very deeply about them.

This is illustrated quite well in the following extract from Interview 4, in which I refer to my observation of Kevin's swaggering, outspoken manner in Observations 3 and 4, including his florid description of how one of his

classmates threw the HANDS phone in their shared taxi to school a few weeks ago.

Joe:
Erm in the last interview you were saying about him … the … we were thinking about you know what are … what are the issues that he's got that one of the things you said that he's got, when he…. and I've seen in the classroom, he'll kind of sometimes engage in this kind of banter in the classroom and he kind of goes too far and he doesn't know …

Mandy:
Yeah.

Joe:
He doesn't know when, when to stop.

Mandy:
Mm.

Joe:
Erm so I wanted to ask you a bit more about that er erm I and I was wondering what you thought was going on in his mind and, and that …

Mandy:
I think he's not too good on social boundaries.

Joe:
Mhm.

Mandy:
Erm and possibly if he's bored and he starts this banter and he gets others involved, he's the centre of attention and I, I, I'm not a psychoanalyst.

Joe:
Of course.

Mandy:
And he enjoys the centre of attention?

Joe:
Yeah.

Mandy:
And he gets others involved and it's fun and school should be fun, but you know sometimes you have to get down to work it's not always fun, but sometimes it definitely should be fun and this is possibly why he does it. It's nowhere near as much as used to do.

Joe:
Right, he's getting better with it.

Mandy:
But we are … as a class we are fairly relaxed until things go wrong erm and I don't mind in the sort of quarter of an hour at the end of the day or the quarter of an hour that they've just had for break time if this sort of banter goes on, so long as it doesn't go too far and in a way if it does go on and then you teach them where the boundaries are, that I think that's now gone far enough, you know it … it'll slowly drip in that this is as far as you take it, you don't take it any further than that.

Joe:
And do you think it's been slowly dripping in with him?

Mandy:

I think so, because he is changing as a character, we don't see this banter as much, part of that might be that a pupil has left the class er who was quite a stirrer.

Joe:
Mhm.

Mandy:
And the class as a class are a lot calmer than they were.

Joe:
Mhm.

Mandy:
Erm that might be part of it, it might be that he, he is learning that you don't do this sort of thing. You learn, you forget, you learn, you forget. Erm you know there are times when he obviously does forget, but all, all skills, all learning comes really, really slowly to them. So yeah, I think he … he's getting there, I'd like to think he was getting there.

Joe:
Mm. Er I mean that kind of behaviour and obviously you, you know you have a better sense, but when I had observed him doing that … it's to me, it's kind of … I mean it was clearly very you know … it's not the kind of behaviour you want from children in the … in the classroom, but to me it's kind of seeing him in some way quite typical, you know you, you often will see teenagers behaving in that way. I mean is it … is it … to me it's kind of you know just seen to be typical … you could interpret it as typical teenage behaviour of a teenager who wants to be the centre of attention.

Mandy:

Mm, but it's not the sort of thing as you say they would do in the classroom, they would keep it for outside and amongst their friends wouldn't they? This is where they …

Joe:
…tell me

Mandy:
… don't understand I think.

Joe:
Right, uh-huh.

Mandy:
That what, what you do with your mates you don't do in a different situation.

Joe:
Right.

Mandy:
That there are formal settings and there are your casual mate settings as it were and I don't think they can transpose the two, that's part of it I'm sure.

This extract serves to illustrate the application of what might be called a classical stimulated recall technique, as discussed in Section 2.2 above, whereby an observed incident in the classroom is used to facilitate an exploration of the teacher's thinking (see Clark and Petersen 1986). Of course, it is not a perfect application of the technique as there was a gap of a week between the observation and the interview. Nevertheless it does seem to have prompted at least some exploration by Mandy. In this exploration, Mandy again eschews giving a place to theoretical knowledge, "I'm not a psychoanalyst", perhaps meaning, "I'm not interested in all that psychobabble". Yet Mandy is

clearly thinking very hard here about what is going in with Kevin, what effect her influence is having on him, and whether his behaviour is or is not normal. She gives a sophisticated explanation of Kevin's inability to tell the difference between formal and informal settings, and broadens this to a general rule about children with autism, which aligns with standard psychological accounts based on impairment in theory of mind (see Györi op cit), as discussed in Section 3.4.1 above.

9.6.2.1 Tolerating Uncertainty

This extract is also striking in its tentative nature, both for me and Mandy. There are lots of pauses, and "Ers" and "Mms". The transcript seems to suggest a significant amount of uncertainty in Mandy's thinking. Yet it is also noticeable that she stays with it, when I challenge her about whether Kevin's behaviour is typical or not, she is willing to explore this. It mirrors, for me, her sustained, calm attention to the children in the moment-to-moment of teaching which we saw in the extract from the fourth observation in Section 9.6.1 above. One of the striking things about Mandy in most of the observations is how calm she usually is, even when quite difficult and challenging things are going on in the classroom. We might consider that this calmness reflects her ability to stay with uncertainty long enough for the "right" resolution, the selected fact, to become apparent. I would argue that there is evidence of the same process of tolerating uncertainty in this extract. The stimulated recall indicates that Mandy does, of course, think cognitively about what is going on for Kevin. Yet the combination of observation and interview data suggests how she balances between them. "I'm not a psychoanalyst" could be interpreted as being very close to Bion's directive to guard against the dangers of memory and desire – desire for knowledge and certainty. As her interview responses indicate, there is still a place for theory and cognitive reasoning, but observation of Mandy, partially based on my counter-transferential response, suggest that hers is a Bionic epistemology in practice and the use of theory and knowledge is mediated first and foremost by what is primarily known from the sustained attention of intersubjective relationship.

9.7 Positioning Towards HANDS

Mandy was initially highly skeptical of HANDS. She was quite explicit in the autumn of 2009 in indicating that she saw it as a distraction and something that was being imposed on her, as in Interview 1:

> *Joe:*
> *How do you think it's going to fit in with what you're doing already in the classroom?*
>
> *Mandy:*
> *[immediate negative? response] Awkwardly!*
>
> *Joe:*
> *Can you expand on that?*
>
> *Mandy:*
> *Time for me to be able to put it on the phone. The fact that if two kids have the phone and nobody else does it's got to be approached will ALL the children in whatever classes they're in, who have phones, that ... 'These two have it and nobody else does at the moment and this is WHY they have them!'*

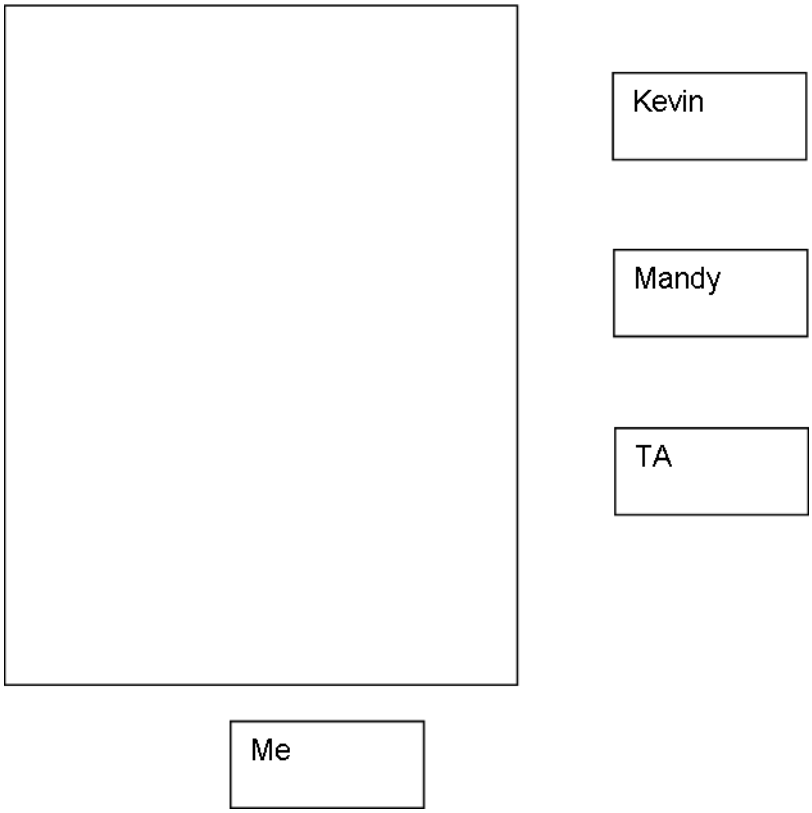
This skepticism and sense of being put upon did surface throughout the implementation, as in Interview 4, when I am asking Mandy about how she thinks the HANDS software might be improved:

> *Joe:*
> *If you hadn't had that particular problem and let's say it would let you go from screen to screen without you having to come out and then go back in again, do you think ... I just wondered what your sense was, of how much work is involved ... is it very onerous or is it a bit of work or ..?*
>
> *Mandy:*

It's more work than I think we were expecting especially as we weren't consulted in the first place as to whether we were happy to do this or not and it's not as though we're given any time to do it; it's slotted in when you can, which is why I took it home and did it over the weekend.

However, what is telling in this response is Mandy's declaration that she took it home over the weekend. Even in the initial interviews, despite her scepticism and worries about HANDS and how it would work out, she still was open to seeing how it might be used. In Interview 1, after saying, somewhat sarcastically, that she wished she had a magic wand to give her 26 hours a day so that she could fit HANDS in, she goes on to talk cogently about how she is going to "find time to play with the thing so I can use it to the children's advantage". And she was true to her word. Even though she experienced significant technical problems, apart perhaps from Lynne, across the project Mandy was the teacher who expended the greatest effort on developing interventions on HANDS and working with Kevin and Marlin to see how they could use it effectively. This orientation persisted even when considerable operational issues continued to occur in relation to the use of HANDS, most significantly Kevin's phone breaking down in late May, followed by a long wait for the school to arrange to have it fixed. In this context, we can see how Mandy related to HANDS, at the end of the implementation in this extract from later in the fourth observation:

Mandy then comes in and says that she's going to interrupt Kevin for a while to talk about his HANDS phone. Kevin smiles weakly and looks rather unsure. Mandy comes and sits boldly down right next to him as follows:



Mandy smiles and asks him brightly how long he has not had his phone for. – "it's been about a month?" Kevin nods. They discuss plans being made to repair/replace the phone Mandy says that she did actually talk to the two men working on it and "they did actually say that they had got it working – briefly".....Mandy then asks Kevin what they should put on it when they [sic] get the phone back? In this sequence, Kevin tends to give monosyllabic, although not uninterested answers and shrugs a lot. He has a coy smile and seems, as generally across this observation, to be quite subdued. There is, in my perception, more explicitly a sense of vulnerability about him. He glances at me, quite nervously, perhaps being aware of being observed, a few times during this sequence. He speaks quite softly and at times his responses to Mandy are hard to

hear. Mandy asks him how may reward points he had on the phone? Her tone continues to be bright, but also, as before in this observation, modulated in response to Kevin's responses – softer when he is softer and anxious, but also leading – as in, said brightly, "You had lots of reward points in there, didn't you?" Kevin says that it was about 20. Mandy says, "Right, so you must have been using it every morning?" and Kevin nods, looking quite pleased. Mandy then asks Kevin how much he personalized his phone, prefacing this with an aside to me, smiling, "this is for Joe's benefit" Kevin shrugs and doesn't say anything – he glances down at the floor. Mandy follows up rapidly with, "You put loads [emphasis] on there" Kevin nods and says, "bit of music...pictures..." I ask, from across the table, "what music did you put on, Kevin?" Mandy replies and says, "lots of music" – I repeat, "what..Kevin?" He looks coy and looks down. He glances at Mandy who smiles at him and he says, "I dunno.....just like any music that I like" in a voice that suggests, "why expect me to say anything else?" I smile. Mandy says, encouragingly, "come on..what about the screen saver?" Kevin nods, looking pleased now. Mandy follows up with "you had a password on it?" and he nods again and then says "Oh yeah.. I had the Chelsea badge on the back". Mandy says, to Kevin, "I mean you personalized it quite a lot – you really did, but it would be good if you actually had the SIM card back as then you could text...in fact it was promised when we came back three or four weeks ago and it hasn't happened...bit disappointing". Kevin nods again. Mandy then asks whether he has done any other things in a soft tone, "What other things?" Kevin says, almost muttering, "Internet". Mandy follows up brightly with, "what do you find worth [Indistinct on tape] on the Internet?" Kevin shrugs and says, "look up the news!" Mandy says slightly tentatively, "so when it did have internet on it you used it as a tool to look up facts and figures about things" and Kevin nods. Mandy continues, smiling, "about football..which is your love we all know that" Kevin seems to be in agreement.

Mandy says that she will chase them up again (about getting the phone back) and that "it would be great [emphasis] to have it back."

Mandy then says in aside to me, "Ok do you want any more than that or have we done our stuff?" I nod assent and Mandy goes "Wahay!" and I say, rather languidly, "Thank you Mandy..thank you very much".
Then, in another aside to me, repeating that the "computer guys" got it working but only very briefly, sounding quite frustrated. Mandy then gets up and goes back to the group in the other classroom. The children and TAs left behind continue with the positive/negative exercise. After a few moments I get up and leave.

In the work-study group's review of this part of the observation, colleagues suggest that Kevin is in fact more engaged with HANDS than the other children in the study. Although Mandy really has to pull it out of him, it is clear that he likes the phone a lot, that he is attached to it in some emotional sense, and that he is upset that it is broken. We also see here more clearly what lies behind his adolescent bravado. I have a clear feeling, when observing him, of emotional vulnerability. He is tentative and anxious, and quite strikingly relies on Mandy to provide him with a source of stability in the encounter, a role which she fulfils very well. Work-study colleagues plausibly suggested that Kevin was very much aware of and affected by my presence. When I ask him a direct question, he is coy and looks down – not the response of a confident teenager to what is on the face of it an innocuous question. I'm an unknown object in his mind and clearly a source of anxiety. Yet with Mandy's facilitation, or we might say containment, Kevin is able to moderate this anxiety and reveal what he really feels about the phone. Kevin's adolescent identifications to this new technology do have echoes of Bollas's ideas about transformational objects, and we could consider that the use of modified infant observation technique has served to illuminate how HANDS might play such a role here for Kevin.

9.7.1 Methodological Considerations

This exchange between Mandy and Kevin also potentially shows the power of a modified infant observation approach to interpretivist research. In a typical ethnographic approach I might have asked Kevin directly what he thought about

the HANDS phone. It is quite likely that he would have, projecting his anxiety associated with being pressed by a stranger, said something like “It’s rubbish” and that would have been that. Yet the power of this technique is that it allows us to emotionally dig under the surface and get closer to the emotional reality of the actors.

9.7.2 Back to Mandy and HANDS

Mandy also seems to have an emotional investment in HANDS. Perhaps mirroring Kevin’s state of mind to some extent, Mandy also briefly projects a somewhat flippant attitude. Mandy says at one point, almost jokingly, that it is all for my benefit. Yet her commitment to promoting Kevin’s use of HANDS, and the concomitant hope that it may be helping him in some way, comes out clearly throughout the sequence. Her comment that “it would be great to have it back” caught me by surprise at the time, but illuminates as well her investment in the phone. This alternation between a flippant and committed position here mirrors the general pattern throughout the implementation of Mandy expressing overt scepticism but at the same time showing significant commitment to working with HANDS.

One possible explanation for this varying state of mind in relation to HANDS might be found in Mandy’s anxiety about her own professional role.

9.7.2.1 Ending up on the scrapheap

There does seem to be evidence of a possible connection in her mind between technology and older teachers ending up on the scrapheap.
It is quite striking in the first interview, when I ask Mandy about what her thoughts are about HANDS, that she focuses on her worries about what will happen when the project comes to an end:

Mandy:

That this is a project for you and I understand after a certain length of time it's over, it's finished! What's going to happen to the kids who may well have come reliant on the phone that bothers me?

Although on the one hand this is a legitimate concern, and one that had been raised by others across the wider project team (although not particularly by teachers), it did at the time seem a little strange to me that this was the first thing that came into her mind to ask about, as opposed to say how the children might use it or how much time it would take to learn how to use. It is also interesting that a short while later in the same interview, when I ask about her career history, that she expresses the opinion that she came to Randall because no one else wanted an "ancient P.E. teacher". Might it be that her concerns about what will happen to HANDS at the end of the project actually reflect an unconscious anxiety about what will happen to her as she comes towards the end of her career? This might explain, at least to some extent, some of her scepticism and flippant attitude towards HANDS. Perhaps this brash new technology may in some way represent, if not something that is going to directly replace her, then at least the new order of things that will not include a place for her.

If this interpretation holds true, then there may be further parallels to Kevin's state of mind. For him, HANDS also represents the future. In 2009/10, the smartphone revolution was only just getting off the ground, and for most teenagers, smartphones were something they might well aspire to but were unlikely to have. Yet here Kevin was presented with one, almost like a bridge into the mainstream adult world, a world that in common with most teenagers he desired to be a part of. However, for Kevin the idea of the adult world was also likely to be terrifying, far more so than for typical teenagers of his age. His deep anxieties about how he was labelled as autistic, and his understanding, even if repressed, that he had failed to cope under the social pressures of mainstream schooling, probably served to undermine his developing sense of autonomy. In representing that bridge into adulthood and normalcy, HANDS was at the same time seductive and terrifying, which would seem to be two likely criteria for an object serving in a transformational role for an adolescent.

So for both Mandy and Kevin, HANDS represented something about the future, but a future in which their place in it was insecure. Mandy's anxiety focused on her thoughts of a future classroom which got on just fine without her, and Kevin's on a future where he fails to find a place in the mainstream adult world. Of course, the redemptive feature in this potentially depressing picture is Mandy's wielding of an adult-containing function, despite her underlying anxieties. She does work committedly with HANDS; she does expertly in the moment support Kevin in managing his anxieties, allowing him even to take pleasure in his achievements in working with HANDS. She maintains a note of hope and optimism which, when spread out over her work with him across the year (not just with HANDS of course), we might conjecture helps Kevin move towards autonomy and independence in the future.

My conclusion is very much that future classrooms at Randall school will certainly be missing something when Mandy does retire.

10. Penny

10.1 Introduction

10.1.1 Background, attitude to ICTs

10.1.1.1 Current Role and Career Background

Penny is originally from Spain. After completing an undergraduate teacher education course specialising in Humanities, she worked as a volunteer at a centre for adults with autism run by a charitable organisation. She worked there for a few months and then heard about a job with a Spanish family living in Nottingham, who were looking for someone to help care for their son with autism. After working there for two years she then came to work at Randall school, initially as a one-to-one support worker but then soon after in a teaching position. Penny has taught different areas of the curriculum, focusing mainly on Geography and History but also teaching English and Personal Social and Health Education and work related learning. In the last few years she has started teaching modern languages, initially French and now Spanish. She is also a form teacher for a mixed Year 8/9 class.

10.1.1.2 Motivation for deciding to work with children with autism

When asked, in the initial interview, what her reasons were for starting to work with children with autism, Penny suggests that it was something that she fell or drifted into, that she enjoyed and it so decided to carry on with it. She does report that during her degree studies she worked at summer camps with children with cerebral palsy, and following that she was offered a job working with a family with a child with autism in Nottingham.

10.2 Key Information Sources for Penny

1st Interview 14th October 2009
1st Observation 24th November 2009
2nd Observation 17th March 2010
3rd Observation 19th March 2010
2nd Interview 19th April 2010
4th Observation 24th May 2010
3rd Interview 18th June 2010
5th Observation 29th June 2010
6th Observation 6th July 2010
4th Interview 8th July 2010

A number of observations and interviews needed to be rescheduled due to absence due to sickness etc.., which partly explains the slightly unusual pattern of observations and interviews indicated. Two observations were scheduled on the 17th and 19th of March, as they were expected to take place over the morning "fruit time" and break. Accordingly two observations were scheduled to maximize the chance of observing the use of HANDS. The observation on June 29th was partially interrupted by the need for the children to go to a Play rehearsal, so another observation was then arranged for July 6th.

10.3 Ability/Attitude to ICT in General

Initial interviews and observations indicate that Penny, whilst not highly competent in the use of ICT, is generally confident and able to use ICT effectively in the classroom, as indicated in this extract from the first interview:

> *Penny:*
> *.. The big interactive board is always on in my lessons and not only for me when I deliver the lessons for the children ... to participate in different*

activities. This is ... children for autism ... children with Special Needs ... I created that ... using the computer ... very simple because I don't have any training in computer but poems ... let the children ... I prepare very simple games where they have to put ... differing objects ... the premier ability group ... looking for sources and looking for things the children can use by use of interactive board ... in charge of interactive boards here in the school....

Penny's use of the phrase "very simple because I don't have any training in computers" suggests that Penny feels somewhat lacking in confidence in her use of technology. She also repeats this theme of feeling unconfident with technology in the second interview. Here in the first interview she says that she wants or needs technology to be "simple" to use, and as will be explored, her experience of HANDS was not simple.

Penny does, however, demonstrate a secure grasp of the use of general technology in the classroom. In the first observation, a Spanish lesson, she uses a PowerPoint presentation showing words associated with the bathroom. It is a well-executed presentation and clearly took quite a bit of time to put together. In this observation she also uses the Interactive Whiteboard (IWB) on screen tools fluently and supports one of the children fluently in their use when he can't locate them. Similarly, in the fourth observation, a Geography lesson, Penny uses a video clip that she later informs me that she sourced from YouTube.

10.4 Penny's Children

Penny has three children using HANDS, Dwight, Andy and Oscar, using HANDS, in her form class. Classroom observation data, teacher, child interviews, and informal visits and interactions at the school form initial impressions of Dwight, Andy and Oscar.

The most interesting and stimulating observations involved Oscar and accordingly the focus of the presentation of the case will be mainly, although not exclusively, on Penny and Oscar.

10.4.1 Oscar

Oscar was born in 1996, making him 13/14 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 116, a VQ of 126, and a clinical psychiatric diagnosis on entry to the School of Autism, with no co-morbid diagnoses. He lives at home with his parents and attends school during the weekdays.

Penny reports that Oscar does well in his school work and is studying at a generally age-appropriate level, with an expectation he will be starting his GCSE programme in due course. He is friendly and sociable with other children. However he has difficulties with executing sequenced tasks and organising himself, particularly in regards to life skills such as getting up in the morning, going to bed in the evening, and being organised in school. Penny also reports that he has a lively interest in technology

10.4.2 Dwight

Dwight was born in 1997, making him 12 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 102, a VQ of 114, and a clinical psychiatric diagnosis on entry to the School of Autism. He also had a diagnosis of ADHD and Tourette's Syndrome. He lives at home with his mother at weekends but lives in the school residential unit during the week and attends the school on weekdays.

Penny assesses Dwight to be at roughly at level 3 for Literacy (below age expected level) and level 4 for History, Geography, Maths and Sciences (roughly at or just below aged expected level). He is very interested in sports

and is in the school's football and cricket teams. He enjoys using Technology and is very proficient.

10.4.3 Andy

Andy was born in 1996, making him 13/14 during the 2009/10 HANDS implementation period. He had a full IQ measured on WISC-IV of 77, a VQ of 71, and a clinical psychiatric diagnosis on entry to the School of Autism, with no co-morbid diagnoses. He lives at home with his parents and attends school during the weekdays.

Academically, Penny places him at around level 2 in all subject areas (significantly below age expected level). He has one-on-one support to help him with his reading, writing and comprehension. He also has difficulties in maintaining and directing his attention to academic tasks and in concentrating for long periods of time.

Andy is from an African Caribbean background.

10.4.4 Oscar's Pattern of Use of HANDS

Oscar was initially enthusiastic about the use of the HANDS phone and the HANDS application. Penny successfully set up, in collaboration with his mother, a number of reminders to help him with remembering what he needed to bring to school. There was, apparently, an initial period of successful use of several weeks, as reported directly from Oscar during exchanges in observations and from interview responses from Penny. Penny also reported that Oscar's mother had been enthusiastic about its use. The log file analysis below, however, seems to contradict this, with no individual function having a significant amount of usage that could be felt to characterize sustained or successful use. This discrepancy may have been due partly to initial enthusiasm for a piece of new

technology which did not translate into actual use and partly to a desire to please me or tell me what they thought I wanted to hear.

Technical issues which involved the HANDS phone being removed from the children for a period of a few weeks at the start of the spring term appear, potentially, to have had a significant effect on Oscar's expressed interest in and motivation to use HANDS and interview and observation data indicate that his expressed interest decreased from that point. There did continue to be some sporadic use of HANDS until Oscar also lost his HANDS phone in April 2010. Although a replacement phone was procured some weeks later there were no further recorded instances of Oscar using HANDS.

10.4.4.1 Log File Data Analysis for Oscar

Oscar has used the phone a total of 53 times out of a total of 1279 for all the children at Randall. A breakdown of the log file data for Oscar indicates the following:

Function	Amount
Appointment Create	0
Appointment Delete	0
Appointment Day View	16
Appointment Month View	1
Appointment Week View	3
Audio Skin Change	1
Interventions - Prompt Answer	0
Interventions – Prompt Ignore	0
Interventions – Prompt Postpone	0
PT	2
Minute Watch	0
Synchronise	25
Visual Skin Change	5

Excluding synchronization, the most used function has been the appointment day view function, still at a low level of 16 times in a period of 10 months. The pupil view for Oscar shows us that he has had a selection of intermittent appointments throughout the year for reminding him about getting up in the morning and the routine for doing so. This has been linked to a Personal Trainer intervention which has reminded him about things that he has to remember before leaving the house in the morning. He also had an appointment for reminders of break time behaviour and for things to remember before going home from school, which was also linked to a Personal Trainer intervention. However, the Personal Trainer function was only used by Oscar on 2 occasions.

10.5 About Penny

10.5.1 Close to the Action

Penny comes across as a competent and caring teacher who is well tuned in to the needs of the children she is working with. This can be seen in the following extract from Observation 6, which takes place towards the end of the academic year, mainly during the morning registration period. One of the children in the class, Luke , normally quite a cheerful boy, arrives about 10 minutes late, just as everyone is settling down to start the day. He arrives accompanied by two teaching assistants.

> *Then Luke arrives. The two TAs are holding him tightly by the arms on either side. He has his head down and has a pained expression. They stand opposite Penny near the entrance (Penny is also standing up and has that calm but expectant (what's coming next?) expression again. One of the TAs holding Luke says, in a tone tinged with anger, "Perhaps you should tell Penny what you've been done...kicking...hitting...and trying to bite" Luke looks down at the ground. His lips are pursed and at*

an angle – he looks almost quizzical (as though to say, "what's going on with me now?"), and also somewhat ashamed. Penny has a calm expression and says very calmly (in contrast to the TA) with a tone of teacherly disapproval, "Oh Luke..." then she picks up a laminated card off the first table and says, "would you like a sticker today?" Luke nods and Penny says, "you have to be...you have to be good..." She then tells Luke to sit down and one of the TAs sits him down at the front table and sits next to him. Penny sits down and doesn't take much more obvious attention of Luke, and switches gear to start the registration period. Her lips purse and she has a more dour expression, and she sits up straighter in her chair. Her demeanour suggests, "Right now we're ready for business". Penny starts the register, saying "Good Morning" to each of the children, prefaced by their name, in turn in an authoritative tone. Penny then goes through the lunch menu, checking what options the children want…

I observe that the IWB has a word document displayed with the order of the day on it. The phrase "Good morning" created in Word Art is at the top and there are some "stick man" images (visualization activities) integrated in to the document.

In the contemporaneous notes to my initial write up, I consider that Penny is "very competent and caring, tuned in to their needs". When I revise the write up after listening to the audio tape, I make a further annotation noting that listening to the audio, stating that "I am struck by how fluently Penny handled the situation", and that "there is no trace of sullenness or hostility in her voice when speaking to Luke". Inter alia, this illustrates how the use of audio recording can facilitate more accurate (and arguably reliable) interpretations of the actions of the actors.

The contrast between the TA's demeanour and actions, and those of Penny is quite striking. She doesn't respond, as quite a few teachers might have done, to the TA's invitation to hear about what Luke had been doing. She judges that Luke is overwhelmed by his feelings at that point, and supports him in calming down by offering him a sticker, as well as remaining very calm in contrast to the

agitated state of both Luke and the TAs (although it is relevant to note that it is the TAs who have had to drag him into the classroom and not Penny). Her exclamation of “Oh Luke”, in a calm voice of “teacherly disapproval”, signals that Penny is in control of the situation, even if no one else is. She also verbalizes both what Luke needs to do right at that moment – “you have to be good”, giving a signal to both Luke and his classmates that in the classroom there are expectations and boundaries for behaviour. Penny judges that Luke needs some space to regain his emotional composure, and by purposefully ignoring him creates that space, at the same time as signalling, just from her “ready for business” body language to the class as a whole that she has dealt with Luke and that he is fine (just as they will be fine too) and that now they will turn to their primary task of learning.

Penny’s close sensitivity to the “moment-to-moment” needs of the children is very similar to Mandy. In the analysis, a data node “Focus on the Kids and Relating to Them”, which included the source extract above, has 4 source references from Mandy and 3 source references from Penny. Similarly to Penny, there is something resonant with the Bionic idea of sustained attention, where by tolerating uncertainty and attending to the experience of intersubjective relationship, the selected fact about what the client (or the child)’s experience is can arise for the therapist (or the teacher).

10.5.2 Working with children with autism

In the interviews, Penny gives some quite detailed answers about her thinking in relation to working with children with autism, uncertainty, and what sources she draws on in coming to a decision about what to do in the classroom.

In the second interview, Penny had told me in quite a bit of detail about her concerns for Oscar. Generally, in the observations, he presented as a personable, very polite boy, Penny noted that he tended to have an air of superiority which led to conflicts with the other children. This was somewhat evident in Observation 3, when Oscar is involved in teasing Andy. We had

discussed whether Penny thought that Oscar's problems related to his autism, and Penny had said that they might but that it also may be related to his mother's attitude, which Penny felt served to reinforce his superior feelings. In the second interview (after the 3rd observation), Penny describes her considerable ongoing uncertainty about how to approach Oscar's social problems

Penny:
Yeah we discuss it with ... obviously the Psychologist Department ... we have this meeting ... every time I think I don't know how to manage something I go to them ...

Joe:
Does that help?

Penny:
Well, unfortunately I don't think we have much idea how to ... apart from talking to him ... because when we try things, for example writing a social story or having some special sessions with him and stuff like that, he become very stressed and go home and then Mum become very stressed and then call us and say, 'Why?' ... in a certain way ... Mum, yes encourage us and wanted for us to encourage Oscar's social independence ... to be ... independent life, independent skills ... like he will be able to manage his own things ... waking up, making his breakfast and these kinds of things ... be responsible of his own items and all these kinds of things ... yes Mother is very happy with all this kind of things....I'm not sure it's because she wanted really that or she wants to do less work as possible and then she doesn't ... get up at the same time than Oscar because Oscar [would] manage his own ... the problem with Oscar is...the only way we can really go to him is we speak to him but when we speak to him we try to explain to him very clearly things ... he interpretate things in the wrong way ... you know, I cannot remember ... and now ... something he wanted to go from beginning of September ... 'I

want to go mainstream school' when we said the school said that mainstream school is no option for Oscar because his social difficulties ...

Penny seems almost overwhelmed by the difficulty of working out how to do anything about Oscar's social problems. Interestingly, input from Educational Psychology, which it seems led to trying out social stories with Oscar, also was not seen as a useful source of advice.

In the third interview, we return to this theme, exploring further Penny's thinking about Oscar, and I ask her explicitly what she draws on when trying to work out how to work with children like Oscar:

Penny:
Oscar... He'd never recognise he does anything wrong [mmm] and then you can… you try to put things in place for him um but he feels that you are thinking that he's less able and this is why he'd need maybe social stories or needs to practice certain skills because definitely it's no good in them. Um he feels we're treating him like a, you know, like a less able student [mmm] because he is very clear that he is in the top, you know, he's the cleverest one in the whole of school and obviously mum encourage that kind of thoughts [mmm] um and then um many times um social stories and stuff like that with Oscar to work because you know he doesn't need that. He is above all these things.

Joe:
Well it seems generally um I mean it seems generally it's kind of difficult to know what to… how to help them with these, with…

Penny:
Yes it does. It is, it is. Um, um…

Joe:
I mean it's difficult, difficult for you as a teacher to…

Penny:
Yeah, yeah, yeah it is, it is.

Joe:
So just thinking about that for a minute cos I, you know, obv… difficult thing about what to do as in generally difficult,...what's gonna help him. So when you're in that kind of situation, with Oscar but with other children as well, what, what do you kind of draw on, what do you use to help you to work out when you're, when you're, you know when it's… you're thinking about… I'm not quite sure what to do it's difficult, what shall I do with him? What, what do you, what do you draw on – is it experience with other children is it…

Penny:
Well it's experience the kids and obviously um this is what I try to put in place as I said before I think, I'm sure I just said it before, or I was talking to somebody else [that's okay] um the kind of students we have in the last two or three years they're very different than ones we had in the past [yeah]. Then I think for all of us it's um it's been a bit of a shock um how to treat these kids because yeah they're behind in many, many situation like in mainstream school kids but at the same time they're children, they have their own difficulties. Then it's very difficult to know how much you can push or how much they're going to understand that what you're trying to explain, talking about social err interaction or social um or independence all this area you know. No academics. um then this is make it very difficult plus, as I say before, um, um we… if and my experience, because I said my experience and these type of kids only the type. Like in many other kids well you know we have Nancy from the speech therapy department or Donald they, they want they can suggest the strategies of things we can put in place to help them but I have to say

the majority of the staff here in the school we are quite lost [laughter] about how to help them, how we can…

Joe:
You said about… also you said in the last interview that you hadn't related those to… you hadn't had any specialist training?

Penny:
No.

Joe:
I mean do you… is that something… would that, would that… do you think that that's something that would help with that?

Penny:
I can imagine but I don't know that cannot be bad but no I don't have any training apart from my qualification of teacher. Um but as teacher in mainstream schools not special school. Obviously my 12 years experience yes but apart of that nothing else, well training, tiny things, but not specific about autism. No.

Joe:
Do you think it might help?

Penny:
Could be yes, yes I can imagine.

Joe:
But you don't sound quite, you don't sound quite sure.

Penny:
Well you know I see all these people all these speech therapists with lots of degrees , and stuff like that [yeah] in autism and I can see Donald with his psychology all this kind of things [yeah] and at the end of the day they

cannot help me they… it doesn't look like they can help me, I am not sure this training will help me much neither.

Joe:
Okay.

Penny:
But I don't know. [laughter] I don't know.

Joe:
I mean I have to say that, you know, I think from all the teachers that I've have… you know I've been observing quite a lot in the classrooms and I think, you know, the team here and I think you've, you've got a very good handle actually on working with these children I mean [yeah] I think… but I think just sometimes it is difficult [yeah, yes] you know there is no… sometimes there isn't any obvious…

Penny:
Answer, no.

Joe:
Easy answer but I mean that's just my opinion [yeah]. [coughs] Um okay so linked to that, and I've probably asked this before, um oh actually wait a minute… there was something related to this I wanted to ask um… Yeah kind of linked to that, I think again kind of thinking about Oscar, you said as well that "we have to understand his interpretations" [yeah] Yeah?

Penny:
Well we have to understand… I am not sure that is the right say [okay] um understand his interpretation is mainly he interprets things in very different way than the rest of us, for example yesterday for example, yesterday for some reason he hurt his back then after lunch he couldn't

move, or he say he couldn't move and then he was sat down in my class in these green chairs, comfy chairs there he was sitting on there, Andy, poor thing, he went to ask him "how are you Oscar?" and Oscar snapped at him and spoke to him very nastily um and then obviously Andy was upset about it "Oh well never mind" he went. Today I asked him say "Oscar what happened yesterday why you were not very kind to Andy?" "Oh because he poke my back" and there was three members of staff there and none of them, the three members I have asked them, they say no he didn't, he didn't touch him, he wasn't even close to him. These are his interpretation on why he was upset with Andy you know and with that I say, for example, this is the whole day through do you know. Um I'm not sure he recognised that as a lie. I'm not sure if, if it's really he believed that this happened or just excuse for him because um yesterday and Monday we had this sponsor run um he's quite competitive boy um and Dwight he did more laps than him and then Oscar he say "oh I couldn't win because my back was hurting" and then from there everything just came. Then he could be upset really because he didn't do as many laps like he wanted to do. He could be upset because maybe yes his back was really hurting or it's just he's natural dislike for Andy but he… this is… he create all this kind of thing of things he interpret things in this way or… I'm, I'm not sure his whole interpretation or how they call it but he's see these things in very different way than the rest of people had to say.

Joe:
And do you think that's… is that part… do you think that's part of his autism – related to his condition?

Penny:
Well mum say it is.

Joe:
Mum says it is?

Penny:
Yes. um I'm not sure…

Joe: What do you think?

Penny:
Um I think he's just a very competitive boy and he doesn't want to recognise when he cannot do… achieve what he want to achieve. I don't think he's able and maybe this could be part of his autism. He doesn't… he isn't able to see what it really his excuse or abilities are. And he feels, because mum tried to err, err make him… his self esteem grow his self esteem, has been saying you're the best, you're the best, you're the best and then he believe he's the best when he maybe doesn't recognise is I'm sorry but you're not because you are scared, for whatever is the reason, they are not there, you know. They are very good but not the best, he had to be the best.

Joe:
Yeah and I remember you, you were saying about this before [yeah] you know about kind of mum and that this, this, this… your view of how mum influenced things [yeah] um influences him. So in your mind… in your view then certainly this kind of behaviour it's not necessarily… my sense is that it's not necessarily to do with this autism it's mainly something to do just with his family dynamics?

Penny:
Yeah I would think so, yeah I would say so.

Joe:
That's interesting.

Penny:

But at the same time I… it could be maybe that link to the autism or not I don't know, is his incapacity to see really his, his where he sees really because every time he cannot achieve what he think he should achieve there is always excuse. There is something, for example yesterday the excuse is my back was hurting um it's I cannot play football or the match didn't went right it's because the rest of the team didn't play properly but never ever his fault. He's not said "well I'm rubbish goalkeeper" he never ever would say something like that or "I did something wrong in English or Maths whenever well maybe because my story was interesting no it's not that "Oh I was very tired, I didn't do it, I didn't both, you know it's this kind… I, I know any other kids maybe would do the same come with the same reaction you know.

Joe:

But I mean I… on the face of it yeah I mean obviously I don't know him that well but I can… yeah I… I've… from when I was teaching I had lots of children, well not lots but a few you know, just…

Penny:

Yeah this is what they say.

Joe:

… exactly the same, you know, very difficult for them to admit that they've got any [yeah] any problems.

Penny:

This is what I said I'm not sure this is, this is because mum or because he's err well he's just being a boy [laughter] do you know what I… [mmm] he doesn't want to recognise that then maybe it is not up to them it's just maybe here [mmm hmm].

It is striking in this extract how difficult it is for Penny to know what relevance Oscar's autism diagnosis has to his social problems. Oscar provokes in her

considerable uncertainty, and moreover uncertainty that is sustained over a long period. Is he a boy whose autism makes it difficult for him to engage in social interaction, or, as I suggest towards the end, is he just, like with many children in early adolescence, quite narcissistic and unable to admit that there could be anything wrong with being like that?

What also comes across is Penny's sense of being "quite lost" in how to help them, perhaps the most explicit avowal of ongoing uncertainty made by any of the teachers. This explicit expression is hard for me to hear, perhaps partly because of the research team's overall orientation towards privileging teacher knowledge, but also partially because on some level I a have a growing awareness of how effectively, as we saw with Luke, Penny does very often work "in the moment" with the children, despite her lack of specialist training and specialist knowledge. As she points out, this knowledge has rarely, when it has been made available, made much difference to working effectively with the children.

10.6 Positioning Towards HANDS

10.6.1 Not Technosavvy

Penny's overall perceived experience of HANDS was probably the most negative of all of the teachers. From the early interviews, Penny reported that, despite the training received, she felt HANDS was difficult to use. She wanted computers to be "simple" and HANDS was not.

Penny wants technology to be easy to use, and to have it explained simply to her. We do see, as in Section 10.3 above, that Penny is perfectly capable of getting to grips with standard software such as Powerpoint, but in her mind HANDS seems to be something more difficult and exoteric (as well as perhaps externally imposed). Many of the teachers commented independently on the complexity of the server based teacher application, and the general consensus

across the project was that this was too complex, so in this sense Penny's reaction to it is perfectly reasonable. It is, however, relevant to note that other teachers, particularly Lynne and Mandy, managed to overcome these interface difficulties. Mandy, who was on the surface negative about technology generally, became probably the most committed teacher to HANDS. For Mandy the interface and other technical issues were an obstacle to be overcome in pursuit of something that, even if it was externally imposed, might help her work with the children. For Penny the interface issues, in conjunction with the other technical problems, were to a significant extent insurmountable.
I set up a data node that illustrated an orientation to HANDS that I termed "technosavvy" which was used to capture instances were teachers had demonstrated a problem solving orientation towards technology where they made constructive use of their existing experience with technology. In this node there were four instances coded for John, four for Lynne, two for Mandy and none for Penny and Kathy.

10.6.2 Negative Orientation to HANDS

Although Penny did show initial potential enthusiasm for HANDS, thinking in some detail in the early interviews about how she might use HANDS to help all three children with managing organisation, by March, technical problems had contributed to Penny having overall a generally negative orientation towards HANDS.

This can be seen in Table 2 which summarises the instances of the high level data node "Teacher Perceptions Towards HANDS":

Table 2 Teacher Perceptions of HANDS

	Technology Not There When You Need It	Technology Issue directly affects use	Preparation HANDS Takes a Lot of Time and Effort	Anxiety about Technology Not Working	Would Like More Training Support
Lynne	0	3	1	1	0
Penny	4	7	1	1	4
Kathy	1	2	1	1	0
Mandy	1	4	1	0	0
John	0	5	2	0	2
AVERAGE	1.2	4.2	1.2	0.6	1.2

	General and Frustration	Rivalry	Uncertainty Anxiety	Absence of HANDS	No One Asked Us if We Wanted to Do HANDS	Sees the Potential For HANDS
Lynne	2	0	1	0	0	4
Penny	7	3	4	6	1	3
Kathy	1	4	3	2	0	4
Mandy	0	0	2	4	1	6
John	0	0	3	2	0	8
AVERAGE	2	1.4	2.6	2.8	0.4	4.4

It is clear from the spread of the data that based on teacher reports, Penny was significantly more frustrated by technical problems from HANDS, and felt that technical problems had a greater direct effect on use than the other teachers. Although there is undoubtedly more complexity underneath the generality of that statement, it is hard to avoid it as a general conclusion.

It is also relevant to note that the last entry in the table, ”Sees the Potential for HANDS”, indicates that although Penny’s general orientation was negative, she did on a number of occasions recognise the potential benefits that HANDS could bring. This can be seen in the following extract from the final interview in July. At this stage, some of the children had moved classes, in anticipation of their new class groupings in the coming Autumn, so Mark was no longer in Penny’s class.

10.6.3 Residual Positivity

Surprisingly, Penny paints quite a different picture of Dwight’s engagement with HANDS, when I ask Penny about how Dwight perceived the use of other functions on the phone apart from HANDS:

> *Penny:*
> *I think so, I think so, I think so. First thing would be the attractive thing to carry and he like erm comedy things. I think his house call erm is try to make a balance. Don’t have something in his life, he likes to accumulate things, I think his house, erm he has tried to make a balance by erm well clearly.*
>
> *Joe:*
> *He likes to accumulate objects.*

Penny:
Yes objects.

Joe:
For home.

Penny:
Yes you can see his school bag; it is the heaviest thing I have ever seen in my life I don't know what he carry in there. His room, and mum because mum left a message a few days ago; his room at home needs to be locked. I think he doesn't like people touching his things, his own things, mum, dad, sister, brother, stuff like that his own things and he take very much care of that.

Joe:
Right.

Penny:
And I think that could be a good thing, the phone had maybe that advantage because it is something he can own, it is mine and he steals things from me and that could be a good thing, an attractive thing for Dwight to use.

Joe:
So you think he could possibly take notice of it because it is my phone?

Penny:
Yes well you know poor thing, he has been carrying his phone until two or three weeks ago you know and didn't do half of the things he should do with the phone and did it work, never. And he has been carrying the phone all this time, all this year you know but the other students, somebody get most of the time actually the same because Dwight's phone is mine, it is

something he owns. I don't know why he keeps forgetting the last few weeks; his behaviour is going down too.

Joe:

What do you think he thinks about all these … what do you think in his mind has been the experience of the phone? The fact that it has all these technical problems and it has not really been working, do you have a sense of what he feels about that?

Penny:

Well I don't know really I think it is maybe and I am going to be philosophical here now, but really I don't have a clue! He is just saying 'oh well something doesn't work in my life' because he is trying to, every time he puts something in his phone, I say "now come on you need to pay attention, make sure you are listening because at this time the ring should go on and they should tell you something and give a message there and fail". It is like 'poor thing another thing that doesn't work in his life'. I don't know just being philosophical, I don't know. I don't know really, well his erm feelings about the phone.

Joe:

But you have seen him in class with the phone and you have seen him when it hasn't worked haven't you?

Penny:

Yes which has been always.

Joe:

So what has been …?

Penny:
Laughing really because I don't think that, as I said, they didn't see it working first and then I don't think he is able to see how good this thing could be for me.

Joe:
Right.

Penny:
Well not for me, it is the same for him. This is not like he is missing anything really because it has never worked. They were missing before their phone and before they had the internet but HANDS they didn't miss anything because they never see the machine working. It is a very attractive phone, very cool and all these kinds of things but it is really something they are not missing.

Although the general negative discourse about HANDS continues in this extract, what was striking at the time was this revelation that up until a few weeks ago Dwight had been carrying the HANDS phone around in his bag, and that in Penny's perception it was something of value to him.

In Penny's account, Dwight's collecting of HANDS as another collectable object seems to be potentially a type of latency organizing behaviour, and also perhaps a rather rigid special interest behaviour typical in autism. It may be either or both, and there may be no clear way, certainly from the researcher's perspective (although not necessarily from the teacher's perspective), to distinguish between the two possibilities. Whichever it is, there could be considered to be a rather adhesive quality as well, in that HANDS and the other collectables, may be serving to help Dwight to hold himself psychically together.

However, as well as these rather arid identifications, which in Bollas's terms might suggest that HANDS is also here something of a terminal object, there does,

additionally, seem to be in Penny's account something of a more hopeful tone. – *"because it is something he can own, it is mine and he steals things from me and that could be a good thing, an attractive thing for Dwight to use".* Although I never saw it in the classroom, Penny suggests that HANDS potentially has another meaning for him, a good and attractive thing that he can own. Bollas (1992, p.19) writes about mnemic objects that conserve a particular, possibly intense feeling state, which via projective identification, are "stored" in the object, and then these feeling states are reactivated when the object comes in to the subject's "day space". Mnemic objects can serve to preserve something important, but they can also serve an auxiliary purpose, holding something for the child that is important perhaps in processing future experiences. Perhaps the HANDS phone, as new technology, in Bollas's term, representing something of Dwight's generation, represents a degree of hopefulness for him? Despite the technical problems, perhaps this symbol of new technology, with its associations of moving on from the old, and surpassing what came before, represents a note of hopefulness for Dwight, that despite all his problems, he too can identify with his generation and the new and exciting things it will do. In this context I recall observing Dwight informally in the staff room between formal observations. Actually arising from an idea which was stimulated by the general use of HANDS, Dougal (teaching assistant Dougal) was getting Dwight to use the phone, (with Dougal's help) to ring a pizza shop and order a pizza. Dwight was enormously reticent and reluctant to do this, and Dougal had to spend quite a long time cajoling and encouraging him to make the phone call. However, when he finally did it, the call went quite well, and for a moment, Dwight smiled and his eyes lit up, something I had rarely seen in the classroom. Perhaps a register of that note of success and optimism was identified with HANDS and that's why, despite all the problems he had lugged it around with him for several months up until quite recently. Of course, it is likely that there are also significant negative identifications, as Penny suggests, with HANDS as well, particularly around its instability, which might mirror the instability of his family life. It's hard to do more than speculate there, although it also seems reasonable that such speculation could also extend to wondering what role HANDS could have served for Dwight if all the technical problems and other issues had not occurred.

Penny's focus on Dwight and his ambivalence towards HANDS might also suggest a similar ambivalence in her experience. Just as Dwight might have some hope for it, Penny too, may similarly partially identify HANDS, new technology designed to develop social skills, with the future, a future where technology can play a positive role in the lives of children with autism, and a future where Dwight may overcome his difficulties and be happy.

This might be, both for Dwight and Penny, a fleeting or transitory state of mind, which is overcome much more typically by the difficulties associated with actually working with HANDS, this "difficult" software. Given the reality of the technical experience, both Dwight and Penny might reasonably to have been expected to refuse to have anything to do with HANDS. We might easily have expected Dwight to have thrown it away and Penny to have refused to have anything more to do with the project. It does seem at least possible that there is some alternative state of mind, linked to their unconscious identification to HANDS and what the phone as new technology designed to develop social skills, and concomitantly agency and autonomy, might represent to them.

11. Cross Case Comparison and Conclusions

11.1 Cross Case Comparison

The focus for comparison across casing was three fold: deductive descriptive codes which derived from the key research questions; inductive descriptive codes which arose either during the initial inductive coding exercise or in iterative coding during the analysis; metacodes based on psychodynamic interpretations derived from work-study review and further review of full case material. Derivation of "descriptive" codes often involved some element of iterative axial coding. Descriptive nodes are derived from direct interview responses related to the node content, indirect responses to other questions which relate to the node content, and observational material which relate to the node content.

11.1.1 Descriptive Codes

11.1.2 Teacher Uncertainty and Autism

A central premise of the study is that teachers experience uncertainty when working simultaneously with children with autism and with new technology. The presentation of the individual cases has indicated that on many occasions, teachers were indeed uncertain.

Table 3 shows source reference incidences by teacher for data nodes relating to this. It is clear from these data nodes, that all the teachers, in some instances, expressed uncertainty about working with children with autism and in relation to working with new technology. Further, for all the teachers, the introduction of HANDS, as predicted in the formulation of the study, prompted them to think about their practice with the children.

Table 3 Teacher Uncertainty

	Uncertainty About Diagnosis	Uncertainty about whether a Behaviour is Autism or Not	Uncertainty Thinking about Strategy Selection General	Uncertainty Thinking About Strategy Selection HANDS	HANDS prompts Thinking About Working with Children with Autism
Lynne	0	0	3	1	5
Penny	1	4	20	10	8
Kathy	2	1	4	1	7
Mandy	10	1	10	3	3
John	0	0	14	8	20

11.1.3 Teacher Conceptualization of Autism and Ways of Working with Autism

I have identified that there is, although often debated and uncertain, what can be considered a core body of cognitive theoretical knowledge about autism as well as a body of best practice autism pedagogy (or pedagogical content knowledge). As has been illustrated in the presentation of the cases, the teachers' understanding of these two domains of knowledge varies. Three high-level data nodes relate to these two domains. "Teacher conceptualization of autism" and "Ways of Working with children with autism", both derived through a process of descriptive and then axial coding, are presented in Table 4 and Table 5. I discussed "Positioning of Theoretical Knowledge" in Section 8.5.1, which indicates that in general the teachers do not make significant explicit reference to the use of cognitive theoretical knowledge when talking about their work in the classroom. However, as shown in Table 4, when the teachers talk directly or indirectly about how they conceptualize autism, some of the concepts presented, such as problems with sequencing or needing time for processing, could be linked to cognitive theoretical knowledge, although many of the concepts could be considered as tacit, that is derived from experience of working with the children.

Table 4 does indicate that the autism pedagogy employed by the teachers broadly relates the pedagogical content knowledge about working with autism reflected in the literature, and there is some commonality to TEACCH guidance, especially in relation to structure and the use of visual approaches. There are, however, significant differences in emphasis between the teachers. For example, Kathy places great stress, when talking about her conceptualization of autism, on considering them as normal and treating them as normal.

Overall, looking at these data nodes across the cases indicates that, despite the generally low level of autism specific training that these teachers have received, their pedagogical content knowledge is broadly consistent with trends for “best practice” autism pedagogy identified in the literature, albeit with significant variations in emphasis between cases.

Table 4 Conceptualization of Autism, showing number of source references by teacher

	Autism is Lack of Transfer of Skills	Children ASD Can't See Beyond Today Show Rather Than Tell	Children with ASD are just Normal	Children with Autism are Stuck in Their Ways or Rigid Thinking	Children with Autism are more Creative	Children with Autism Don't Recognise or Agree to Social Rules	Children with Autism Sequencing Problems	Don't Recognise Other Points of View
Lynne	0	0	0	1	0	0	0	0
Penny	0	0	3	1	0	1	2	0
Kathy	0	2	24	0	1	0	2	0
Mandy	1	0	0	0	0	1	1	0
John	0	0	0	0	0	1	2	0

	Labelling (Diagnosis) is part of the problem (2ndry effects labelling)	Lack of A Sense of Time	Restricted Capacity in Autism affects potential for autonomy	They Need Time to Process Percolation	They Seem to Understand But They Really Don't	Every Child with Autism is Different
Lynne	0	0	16	0	0	1
Penny	0	0	3	0	1	0
Kathy	0	0	10	2	0	0
Mandy	4	0	6	2	0	0
John	0	4	4	8	0	4

Table 5 Ways of Working with Children with Autism, showing number of source references by teacher

	Empathise With Them Put Yourself in Their Shoes	Low Arousal for Children with Autism	Meeting in the Middle (Society and the Individual) re Autonomy	Practical Work Is Better	Reach Out and Draw Them in to Relating (explicit expression)	Relate to Them (implicit expression)	Attit. to Working Flex. and Patient - Trying It Out
Lynne	0	0	2	0	1	0	0
Penny	4	0	0	0	0	2	0
Kathy	0	0	4	0	18	2	0
Mandy	0	2	0	0	0	8	1
John	0	0	0	2	0	4	5

	Repetition Can Achieve Behaviour Change	Speak to Them Like Normal Kids	Structure is Key for Children with Autism	They have problems but its great when you help them overcome it	Visual Support and Non Verbal is Important for Children with Autism
Lynne	0	0	0	0	0
Penny	4	0	1	1	0
Kathy	0	5	0	1	5
Mandy	0	0	6	2	1
John	0	0	0	1	8

11.1.4 What sources of knowledge do teachers make use of in the classroom?

The teacher thinking literature indicated the potential difficulties in getting teachers to talk explicitly about their thinking processes when making particular decisions in the classroom. This was certainly borne out in the data collected in this study, however, as the presentation of the individual cases demonstrates, it was possible with judicious questioning to get teachers to talk broadly about what sources of knowledge that they make use of. As Table 6 indicates, their responses indicate a balance between their use of knowledge derived from experiences with individual children (”getting to know them is key”), from experiences with similar children in the past (perhaps a form of tacit knowledge), from colleagues (especially teaching assistants) and from other information sources, such as in-service training courses, reading and the Internet.

Table 7 represents a meta data node, “Teacher Positioning in relation to Expert/Theoretical Knowledge”, developed via axial coding, which was used to categorise source references where teachers either discussed or otherwise indicated the relevance of theoretical knowledge about autism to their practice. These references were further categorised as to whether teachers positioned expert/theoretical knowledge as useful or not useful, or whether they were uncertain about its usefulness. In 18 source references, teachers indicated that they did find expert knowledge in general, specific expert knowledge from colleagues (that is Educational Psychologist and Speech and Language colleagues) and diagnostic information about individual children useful. However, the node equally shows that in 15 source references (with some instances occurring in all teacher cases) across the same sub-categories they were uncertain about the usefulness of expert knowledge. This contrast demonstrates, perhaps prosaically, that the teachers were not always sure if expert knowledge was helpful.

Table 6 What do teachers draw on when making decisions about what to do in the classroom, number of source references by teacher

	Getting to Know Them Initially is Key	Draw on What Worked Before or Not Experience with Sim. Kids	Drawing on Knowledge from the Web	Drawing on Other Teacher Experience inc' TAs working with them	Drawing on Training Courses and Reading
Lynne	0	1	0	5	0
Penny	4	4	0	0	0
Kathy	3	0	1	2	2
Mandy	0	0	0	2	0
John	3	4	0	4	2

Table 7 Teacher positioning in relation to expert/theoretical knowledge, number of source references by teacher

	Expert Knowledge (general view) Useful	Expert Knowledge (general view) Uncertain	Expert Knowledge (general view) Not Useful	Expert Knowledge (from colleagues) Useful	Expert Knowledge (from colleagues) Uncertain	Expert Knowledge (from colleagues) Not Useful	Expert Knowledge (diagnostic info) Useful	Expert Knowledge (diagnostic info) Uncertain	Expert Knowledge (diagnostic info) Not Useful
Lynne	1	1	0	2	0	0	1	1	0
Penny	0	2	0	1	1	1	0	1	0
Kathy	2	0	0	2	2	0	0	1	0
Mandy	0	0	0	1	2	0	1	0	0
John	4	3	0	2	0	0	1	1	0

11.1.5 Teacher Positioning and Autonomy and Independence

A potential aspect of uncertainty identified in the formulation of the study related to the children's potential for agency, autonomy and independence. The teachers' preoccupation with this issue in many instances has been seen in the presentation of the teacher cases.

As Table 8 shows, comparison across the cases indicates that the teachers were generally committed to promoting the autonomy of the children and to developing life and social skills in the here and now in the context of developing their independence. They also had, in most cases, significant uncertainty about their potential for independence in the future. There were no source references for this area for Lynne, which might be related in some way to her role in the Further Education setting.

Interestingly, in all cases the teachers saw HANDS as something that could potentially serve to develop the children's autonomy.

Table 8 Teacher Positioning on Autonomy and Independence

	Teacher Aspires to Develop Autonomy	Focus on Life and Social Skills for Independence Now	Teacher sees HANDS as potential Autonomy Tool	Uncertainty about cap.for Indep. in the Future
Lynne	19	8	12	0
Penny	2	3	9	2
Kathy	25	14	19	11
Mandy	7	10	6	7
John	7	12	7	3

11.1.6 Conclusions about Descriptive Node Comparison

When comparing the presentation of the gestalt of the individual cases with the node comparisons here, the former do seem to hold the power of the psycho-social approach. To that extent, Carlberg's (2010) suggestion (see Section 5.5.10 above) that case comparison can add to the validity of psychoanalytically derived case material seems questionable. Having said that, comparison of source reference instances does serve to provide a broader overview of the data and allow for a more informed judgement as to how particular factors at play in particular cases may or may not relate more broadly to other cases. Table 8 serves as an example. Thus we can see that the preoccupations that Mandy had in regards of the future development and autonomy of Kevin are not isolated to that case, but present with most of the other teachers as well. We also see from the cross case comparison that despite the uncertainties expressed at times in the individual case presentations about what will happen to the children in the future, the overall orientation of the teachers is clearly towards developing autonomy. This is not something that would easily be derived from looking at the individual psychoanalytically orientated presentations of each case.

11.2 Emergent Themes and Conclusions

11.2.1 Identifications to HANDS and Technology

Although it was not identified as the most significant aspect in the formulation of the study, inductive analysis foregrounded identifications to technology by the teachers as one of the most interesting themes arising from the data. I argue that a psycho-social approach was particularly well-suited to illuminating such emotional identifications to technology.

The idea that people have some sort of emotional relationship to technology is present in various forms in the human-computer interaction literature. In this context, I have already discussed user emotional attachment and mobile marriage (see Section 2.9.3 above). Fogg's formulation of the latter is based, to some extent, on Nass, Steuer, and Tauber's (1994) Computers are Social Actors (CASA) theory, which proposes that people tend to make use of social cues and conventions in interacting with computers. CASA theory does not propose that people consciously think that computers are real people, but based on empirical observation proposes that in some limited ways they interact with them as though they are people. Taking a psychoanalytic perspective, one could propose that there are aspects of the dynamic unconscious at play in these human-to-computer interactions. Whitty and Carr (2006) make just such a move in considering the application of Bollas's concept of transformational objects and Winnicot's concept of transitional objects. However, their elaboration is underdeveloped, and suffers from an absence of "clinical" material.

In contrast, in this study, I have, using a modified infant observation approach, been able to develop, based on empirical material, a better elaborated, psychodynamically informed model of professional interaction with technology

innovation for those working in the caring services. This is shown in Table 9, where I propose categories of interactional patterns between teachers and new technology. In this, the technology is conceptualized as a psychoanalytic object which is positioned within a relational field. In this context, an understanding of the particular modes of identifying to technology by both caring professional (teacher) and client (student) serves to provide a better understanding of what the experience of encountering technology innovation means for the actors involved. As I discussed in Section 3.10.2 above, this also includes an account of how new technology can play the role, as Bollas suggests, of generational markers serving as transformational objects for a particular generation (Bollas, 1992, op cit). As in Penny's case, the presence of these potentially strong identifications in the relation field, where new technology potentially has such meaning for an emerging adolescent generation, can also influence how those in a caring professional role relate to the technology. In this context, Penny can be seen, via projective identification, as assigning to this new technology, even in the face of the actual experience of technical problems, the potential to represent something hopeful about the achievement of autonomy and independence.

Table 9 Interactional Patterns

Teacher	Interactional Pattern	Expression
Lynne	Idealization/magical thinking.	HANDS will allow her not to have to engage in difficult problems; used as a way of escaping anxieties and uncertainties in relation to working with the children
	Rivalrous identification	HANDS viewed as a new tool that her "sibling" teachers have been given more access to
	Realistic Positive	Sees the potential for the technology to make a difference to the lives of the children she was working with and was able to tolerate uncertainty and anxiety and utilise her experience of working with the children to decide on how it might be used.
Kathy	Splitting, idealization of HANDS	Engaging in splitting, projecting negatively on to other school aids, based on its association in her mind with a harsh judgemental internal object (the school management), and simultaneously projecting positively on to HANDS. This projection, however, seems to be based on magical thinking and could be regarded as having a brittle omnipotent quality to it.
	Realistic Positive	A more realistic evaluation of the role of the technology, now based on actual experience of using it, attuned to the actual needs of the children.
John	Negative K link/terminal object	An arid, and almost dead quality in John's use of HANDS, where it functions as a representation of an escape in to cognitive function in preference to intersubjective relatedness as way of dealing with anxiety
	Realistic Positive when in male/female	On occasions, particularly when supported by Jean's "maternal

	containing constellation	containing function", uses cognitive function flexibly to address children's needs
Mandy	Realistic Positive	Integrates HANDS in to her ongoing primary focus on working effectively with the children; anxieties are subsumed in an adult containing function
	Projective identification – new technology provokes anxiety based on life stage	Brash new technology may in some way represent, if not something that is going to directly replace her, then at least the new order of things that will not include a place for her.
Penny	Realistic Negative	Negative experience and perceived complexity rationally reduce motivation to work with HANDS
	Projective identification – new technology and future optimism	(Partially) identify with HANDS, new technology designed to develop social skills, with the future, a future where technology can play a positive role in the lives of children with autism, and a future where individual children with autism may overcome their difficulties.

The patterns of interaction as shown in Table 9 are inevitably an abstraction of a complex underlying pattern of identifications. However, the process of abstraction is useful here in allowing us to "gain a handle" on how unconscious processes in relation to technology, sometimes stimulated by ongoing uncertainty about how to work with children with autism, can have a significant role in the actual pattern of use of new technology in the classroom. This sort of in-depth analysis of emotional patterns of interaction is currently largely absent from the literature on educational technology use. The encounter between caring professionals and new technology may involve quite complex patterns of emotional identification, which has a bearing on how they make use of that technology in their professional practice. The psychodynamically informed model of these processes that is presented here has the potential to illuminate, for those involved in technology implementation in the classroom, some of the ways in which emotions, sometimes hidden beneath the

surface, can have an impact on how teachers react to and use technology. Mandy's case is a good example. Although the existing literature indicates that older teachers may well have a negative disposition towards technology (see for example Broady et al., 2010), such accounts typically lack an explanatory framework. It could potentially be very useful for those involved in implementing new educational techology solutions to have an understanding that for teachers in the later stages of their career, like Mandy, identifications to very new technology, which may be unconscious in nature, may provoke anxieties based on life stage. A sensitivity to the nature of such anxieties might allow for the development of strategies during the implementation process that could ameliorate (in psychodynamic terms contain) such emotional identifications. This could promote the adoption of more "realistic" interactional patterns by the teachers (or other caring professionals) involved, leading to a more positive outcome for teachers, children and managers involved in the introduction of new technology.

Proposing such an approach raises the question as to whether achieving this better outcome means that educational technologists should become deeply conversant with psychoanalytic theory. This is indeed an unrealistic proposition. However, I would contend that, although it is outside of the scope of this thesis, there is potential in integrating concepts from human-computer interaction and psychoanalysis, and translating these ideas into a form digestible by those working in not only educational technology, but also more widely in technology development across the caring professions.

11.2.1.1 Further reflections on the role of HANDS in the research

I have identified particular patterns of identification to new technology by the teachers in the study. It is also to relevant to reflect further what might have been evoked for the teachers by the specific HANDS technology. As an instantiation of persuasive technology (see Section 1.3), HANDS was based to some extent on a neo-behavourist model of how to bring about change in young people with autism. However, it was only partially so, in that the technology was positioned as a tool

forming part of the ongoing relationship between teacher and child. Nevertheless, HANDS was presented to the teachers as persuasive technology, and it might be relevant to speculate on what this might have meant to them. In Section 8.7, I discussed how, for John, HANDS may represented science and technology, and thus his unconscious pattern of identification to HANDS at times might have been as part of a comforting flight in to scientific theoretical reasoning. More broadly, the teachers as a whole may have implicitly associated HANDS with a psychological or scientific approach to bringing about behaviour change in the children that they were working with. As such, in terms of the spectrum of positioning between tacit/experiential modes and theoretical/expert modes of relating outlined in this thesis, HANDS might have evoked a particular bias in their thinking towards theoretical modes. This might be the explanation for the particular mode of identification to HANDS I consider for John – namely it arises as an artefact of the intervention, rather than telling us anything useful about John. However, whilst there is a certain allure to this line of reasoning, it is hard to find support for it in the empirical data. In particular, the identification pattern seen with John is not repeated with the other subjects, whereas if HANDS as an artefact was implicitly introducing this kind of systematic bias, then we might reasonably expect to see this kind of identification occurring at least to some extent with the other subjects. Yet we do not. As such, the study as a whole can be considered as allowing a fairly unbiased exploration of the different ways in which teachers deal with uncertainty, and in particular, the extent to which in Bion's terms, they manage to maintain an open intersubjective relationship to the children they are working with when dealing with uncertainty.

11.2.2 How Do Teachers Deal with Uncertainty

It is clear from the individual case presentations and from the cross case descriptive node comparison, that this field of study, with autism and new technology, was indeed a fertile crucible for teacher uncertainty to arise and be examined. How then can we productively think about this uncertainty?

In Chapter 4, eschewing on ontological grounds a socio-cultural interpretation of Schön, I used Bion's Kantian approach to plug the gap in Reflection in Action. Using Grotstein's perspective on Bion, I considered that Bion proposes that the analyst come to know and understand the analysand via a dialectic between "knowledge" derived from intuitive, empathic intersubjective relatedness to the human other and the use of conscious cognition. The emphasis, however, is very much on the former, and Bion's directive to abandon memory and desire indicate clearly that it is the productive space provided by uncertainty, by "not knowing", by uncertainty, that can truly lead to a genuine understanding of the human other. Moreover, Bion's use of O places a particular value on human agency, human potential and the possibility of "becoming". It is only in the toleration of uncertainty in the encounter between analyst and analysand, that the analyst can transform the O of the patient in to his (i.e. the analyst's) own personal O and into cognitive knowledge that will help the analysand in achieving that potential. I contend that for professionals in the caring services, it is this metaphysical intertwining of intersubjective relatedness and cognition that happens when, in the moment, they reflect in action.

Transposing this conception of intersubjective relatedness from the couch to the classroom is a jump, but it is one that I make, and that I believe is supported by the use of a psycho-social approach in illuminating how teachers deal with uncertainty. This is particularly so for teachers working with children with autism, where the ongoing preoccupation with the development of social and life skills make issues of agency and potential so very potent and relevant.
The cases of John and Mandy in particular serve to show how this can be seen "in action".

John, a teacher of truly good intentions, thinks hard about theoretical and expert knowledge. He is also, after Bion, well aware of the dangers of an overreliance on this type of knowledge. As we saw in chapter 8, in his third interview John says "I think if I read too much what it would do is turn me into a boffin who knew this and

that about autism but wouldn't necessarily have the practical knowledge on it". However, as the case material I believe amply demonstrates, on some occasions John is, when working with the children, "The Academic Patrician", and that at times, he takes refuge in the supposed certainty of expert and theoretical knowledge. A particular example is shown in Section 8.7, where John, in thinking about Jeremy's echolalia, responds in a way which I describe as having something of an arid, scientific quality to it, which seems divorced from the reality of the human other he is working with. On this and other occasions, John loses touch with the children, coming out of intersubjective relatedness with them, and because of that he ultimately "knows" less about them, about what they need and about how he could support them in achieving their potential.

In contrast, Mandy places relatively little stress on expert/theoretical knowledge although the cross-case comparison in Table 4 and Table 5 indicate that, in line with the other teachers, she has at least a reasonable understanding of best practice approaches to working with children with autism. Similarly to John, she also is suspicious of the potential efficacy of specific expert and theoretical knowledge. For example, as we saw in Chapter 9, in her third interview Mandy says that, "she is not a psychologist and doesn't think about them too deeply", and then indicates that she has not actually made any active use of the expert knowledge residing in the educational psychology service for a number of years. However, in contrast to John, observation indicates Mandy is much more able to tolerate uncertainty when interacting with the children. For example, in Section 9.7 above, we saw how Mandy interacted with Kevin as we talked about Kevin's experience of using HANDS. In this vignette, the very anxious and troubled teenager below Kevin's usual brash facade was much in evidence, and it was striking to see how effectively Mandy, through her nuanced, "in the moment" reactions, provided him with a source of stability in the encounter. There and in many other instances she managed to maintain intersubjective relatedness to her children with autism, which ultimately results in her being better attuned to their needs, and I would argue, better able to promote their individual development and autonomy.

In coming to these conclusions about Mandy and John, it is relevant to note that my counter-transferential responses, and their validation and exploration in the work-study group, are very significant. Indeed, judgements about whether Mandy or John at any particular time are in intersubjective contact, are based largely on the use of this psychodynamically derived antenna.

I contend that the data, derived from a psycho-social approach based on infant observation, does provide evidence to support my assertion that for teachers working with children with autism, reflection in the moment is usefully considered in Bionic terms.

I would also go further, and extend this argument to the teaching profession as a whole. It could be argued that teachers working in mainstream settings might have a greater focus on academic rather than emotional or social development issues. However, in the UK at least, policy developments such as Every Child Matters (DfES 2004) have led to an ongoing broadening of the role of teachers, which encompasses children's mental and emotional wellbeing. More importantly perhaps, a psychodynamic approach to thinking about education, as set out so eloquently by Coren (1997) or Wittenberg (1999), would point us towards an understanding, as indicated by Bion, of the centrality for teachers of intersubjective relatedness in the development of "knowledge".

11.2.3 How Should Teachers Deal with Uncertainty

As I have argued, Schön's conception of reflection in action leaves a gap as to what actually does go in the moment when caring professionals work productively with clients. We can plug this gap, I contend, with a conception of intersubjective relatedness based on Bion. Specifically, this implies that teachers engaging in a professional encounter involves them in making use of a body of professional

knowledge, as well as simultaneously engaging in the struggle to come to know the human other. Bion's injunction to abandon memory and desire is important because it suggests to teachers that they should have the courage to grapple with uncertainty, something which too great a focus on professional knowledge may serve to draw them too far away from.

I have also argued ontologically, based on Grotsteins' interpretation of Bion's idea of "O", that for us to conceive of the human subject as having a meaningful notion of agency implies that a kind of productive uncertainty is inherent in how that agency arises. Bion's later project implies that human "becoming", that is the creative development and flowering of the person, involves the individual grappling with coming to know their own personal "O". It is the analyst's role, through the exercise of their free-floating attention unhampered by memory and desire, to help the client in their journey to reaching this state. It is a difficult, challenging, uncertain process that it is all to easy to turn away from, particularly through flight into the comfort of certainty.

Teachers, particularly those working with children with autism, are so often concerned with developing the autonomy (i.e. agency) of their children. Using Bion's ideas to plug Schön's gap also implies, therefore, that teachers should give cognizance when thinking about how they work with their children to the productive role of uncertainty in facilitating both the professional coming to know the child and the child in coming to know themselves.

So my theoretical merging of Schön and Bion, as supported empirically by the individual teacher observations, suggests that having uncertainty should be thought of as a good thing. Teachers should be encouraged to engage with and tolerate uncertainty, and concomitantly or equivalently to place a premium on maintaining intersubjective relatedness with the children they work with. My analysis does not suggest that concrete expert knowledge, about diagnoses, what autism is, or about how teachers should work with children with autism, is not relevant for teachers. Bion's psychoanalytic theory is firmly based on the use of

theory and models, although he calls for analysts, particularly through the grid, to engage with and re-create these theories models in their own terms. What my analysis does suggest is that a) the first port of call for teachers should be their interaction with the child as a human other, b) that teachers should be open in recognising that uncertainty can be productive and c) that teachers should recognise that encountering uncertainty in their work with children can be very difficult, but that there is more to be gained by staying with the struggle than by fleeing from it too early, into the promise of expert solutions. Putting it another way, it may not be practical or even desirable for teachers to abandon memory and desire, but it is still crucial for teachers to recognize the dangers inherent in clinging to them too strongly.

11.2.3.1 Policy Implications

In Chapter 1, Section 1.12, I noted the lack of curriculum input on special educational needs in initial teacher training in the UK. Given this, it was perhaps not surprising that none of the teachers at Randall School had any in-depth specialist training in ASD. However, as I discussed in Section 11.1.3 above, their knowledge base and observed practice was still broadly aligned with what might be considered best practice in autism pedgagogy. It is not clear, however, from the analysis I have presented, that a greater emphasis on specialist training for teachers, either at pre-service or in service stages, would be beneficial. Would Mandy have been a better teacher of children of autism if she had undertaken a postgraduate qualification in SEN? It is hard to support this from the evidence presented. I would rather argue that based on Mandy's example, those developing training programmes for SEN should make teachers aware of the importance of a model of professional practice that has the struggle with uncertainty at its centre. This call for teachers to recognise the place of uncertainty in their work sits within the context of wider policy debates about the place of professional knowledge and tacit knowledge in teaching. As can be seen from the recent Education White Paper (DoE 2010), the political policy pendulum tends to veer between, on the one hand, stressing the need for teaching practice to be based on expert knowledge

and, on the other hand, declaiming that teachers can only truly learn from watching good teachers in schools. I would hope that, independently of the current political trend, my call for teachers to recognise uncertainty can be of use to teachers whatever the prevailing policy context, although it is certainly the case that recent policy trends towards the instrumentalisation of teaching do tend to push them towards grabbing the latest knowledge package dropped in from on high, and thus potentially away from working intersubjectively with their students. However, I would argue that in all policy frameworks, ultimately it is teachers and not education ministers nor even headteachers, who work with children in classrooms. It is in those classrooms, albeit always within a wider macro- and micro-policy framework, that teachers make moment-to-moment decisions. This moment-to-moment interaction is the inescapable stuff of teaching and I contend, based on the empirical observations I have presented, that teachers will make the best use of expert knowledge if they do so in a context where they recognise the paramount importance for them as caring professionals to genuinely engage in the difficult, uncertain but ultimately so productive encounter with the real human others that inhabit their classrooms.

Further, this call can be applied not just to teachers but more broadly to other professionals working in the caring services.

11.2.4 Ways Forward in Tolerating Uncertainty

11.2.4.1 Issues with Psychoanalysis and Teacher Education

I have suggested that teachers can make productive use of uncertainty in the classroom. A reasonable corollary of this position is that some way might be found of introducing approaches designed to develop this capacity in to either pre or post service training programmes for teachers.

Although this sounds potentially useful on the face of it, there are significant problems associated with introducing ideas from psychoanalysis in to teacher education. In my own experience as a teacher educator, I have tried as part of both pre and post service courses to introduce students both to psychodynamic theory and to reflective approaches based upon such theory. This has been with varying success, which mirrors the very long history of hope about how psychoanalysis could be exploited in education, going back both to Freud and Klein. For example, Klein (1998, p.53) explicitly suggests that nurseries should be staffed by trained analysts. Yet, the reality, as Saltzmann (2006) points out, is that relatively few teachers internationally have any psychodynamic content in their initial or continuing training, mainly because it is, as my own experience shows, very difficult in the limited training time available for teachers, to introduce them in any effective way to the often quite complex and nuanced theoretical ideas involved. Nevertheless, there are examples of successful approaches. Gerda Hanko (2002) piloted the use of 'psychodynamically orientated' teacher support groups in schools in the UK. Jackson (2005) has also undertaken pilots of the use of similar groups, with a focus on the development of observational skills. Hanko and Jackson generally followed the example set by Balint and Caplan in setting up their groups to look at 'work-study observations' from a psychodynamic viewpoint, with someone external to the group acting as a facilitator (Caplan, 1970). These groups worked collaboratively to understand the behaviour of the individuals involved in a particular interaction and generated new ideas and suggestions for dealing with the perceived problems.

11.2.4.2 Reflections on a modified Infant Observation Approach

Reflecting on my use of a modified infant observation approach to thinking about professional practice, I think it proved effective in allowing me to come to reasoned judgements about teachers' emotional experience of dealing with uncertainty, frustration and anxiety in the particularly uncertain context of working with children with autism and new technology. Applying psychoanalytic techniques, particularly

the use of counter-transference to identify teachers' emotional states, did in itself provoke uncertainty within me in my role as a researcher. As I noted, in a number of instances, particularly in Kathy's case (see Section 7.6.7), I was aware that the conclusions that I was drawing about the subject's emotional experience was potentially open to criticism as part of the ongoing debate about how psychoanalytic techniques can and should be applied as part of social research methods. However, my incorporation of these techniques as part of a realist perspective does, I think, avoid the dangers of "wild analysis" (Brown, 2006), even where I make what could be regarded as critical judgements about the emotional states of the subjects. The use of audio recording, the significant amount of material collated per participant (an average of 10 hours of observation and interview material as well as more time in informal contact), the combination of whole "gestalt" analysis of cases and cross case comparison facilitated by coding of text (see Section 5.6.5), all provide a reasonable basis to defend the credibility and trustworthiness of the material and the conclusions. As well, and perhaps most importantly, the use of work study review, an integral part of the Tavistock infant observation method, proved crucial in allowing me to differentiate between my own transferences and the emotional states of the participants. That is not to say that there are not uncertainties involved. Indeed, in the coding analysis, one of the data nodes used most frequently was "Uncertain State of Mind" used to denote my uncertainty about the particular emotional state that a subject was experiencing. The process of infant observation implicitly involves grappling with the uncertainty of what the situation means, and developing the capacity to move through the frustration of such experience towards the knowledge that can be derived from open intersubjective connection with the subjects (in Bion's terms knowing based on 'O'). This also very much applied in my own use of a modified infant observation approach in this study.

Further, I certainly recognize that there are significant dangers for researchers, as Brown (ibid) discusses, of over identification with their research programmes and their status within academe, which can "interfere" with the application of psychoanalytic technique in social research. Indeed, I discuss this very issue at several points within the thesis (see Sections 5.6.5 and 7.6.7). Yet work-study

review served to help identify my significant over-identification with HANDS and the ways in which this might interfere with the judgements I was making about the emotional states of the subjects in the study.

Nevertheless, as I consider in Section 5.7.1, adopting a realist interpretivist position does not imply that social research actually allows us to come to an objective, reified conclusion about the truth of a particular subject's experience. The subject's experience is complex as well as being variable. The dangers of the Platonic backhand in social research are all too real. Nevertheless, the application of psychoanalytic techniques, such as counter-transference, in a properly regulated format, can, I contend, once we have ourselves as researcher gone through the productive experience of engaging with the uncertainty of what particular emotional reactions might mean, tell us something of the truth of the emotional experience of subjects in social research.

11.2.4.3 Lessons from Infant Observation: Towards Action Research

One of the intended outcomes of undergoing traditional infant observation as part of psychonalaytic training is that it is intended to develop sensitivity to emotion and an increased capacity for learning from experience, i.e. the ability to tolerate frustration (or uncertainty), to avoid (after Bion) too early a flight in to theory, and to maintain and foster a free floating attention to intersubjective experience (reverie). (Rustin, M.E., 1989). In a very similar view, Susan Dykes in her seminal Paper (Dykes, 1987) on the potential application of psychoanalytic concepts in the classroom proposes that its most productive use for teachers lies in the possibility of creating a space to think about the relationship between themselves and their students, and that this inherently involves reflecting on their own emotional states, and learning from those, which may then lead on to an enhanced capacity to tolerate the frustrations involved in working with children in classroom settings.

This is all very well but it still leaves unanswered the question that I have posed, namely what could practically be done to take these potential lessons from infant

observation and psychoanalysis and somehow allow teachers to develop the capacity for dealing with uncertainty that I have suggested could be useful within teachers' professional practice.

One possible path could be via an integration of the type of facilitated modified infant observation approach I have used in this thesis with an action research approach. The teacher action research movement (Carr and Kemmis 1986, Gewirtz et al. 2009) is strongly rooted in Schon's influence. In the action research cycle, an individual teacher identifies a particular problem in relation to their own practice that they would like to explore. This could be with a particular child, with a class, or if they are a senior teacher, it could be with their department or with the way that a particular school process that they have some influence over operates. Often using hermeneutic or narrative research techniques, they undertake a study of themselves and the problem, and create a set of recommendations that they then put in to practice. They then reflect on the experience, perhaps leading on to further questions and issues arising from the original problem, which then feeds in to the next stage of the action research cycle. Owing much to Schön's influence, the idea of this iterative cyclical approach is that it leads to teachers developing the capacity to reflect on their own practice.

It is relevant to note that this cyclical model has some degree of resonance with Bion's model of Learning from Experience (1962).

One could envisage an action research programme where the problems identified are instances of experiences of uncertainty and frustration in relation to the children in their classrooms. We could further propose that the modified infant observation method outlined in this study, with its integration of techniques from both infant observation and traditional interpretivist social research, might form the basis of an approach that could usefully be applied by such teachers as part of the action research cycle. In some sense we might regard this as a developmental approach which facilitates the ability of teachers to reflect, Such a programme would be, I think, necessarily integrated with a work study group approach, similar to the one employed in this study as well as in Hanko's and Jackson's studies. Thus we could envisage groups of teachers involved in such action research

programmes bringing their problems and their progress with them to periodic work-study review.
It is also relevant to note that such a self-reflective approach mitigates one of the most significant methodological critiques raised in this study, namely the inability of researchers to properly “test” out their interpretations in the same way as the analyst can when with the analysand. Of course, a teacher engaged in self-reflective action research has much more opportunity to test out, even if only implicitly, whether the conclusions drawn from the action research cycle do match with the child’s perceptions or not.

An example from adapted from this study might illuminate how this could work, and its potential in particular for teachers working with children with autism, with all the considerable uncertainty that that entails.

11.2.4.4 Working with Angus

One of the children in the study, Angus, in Mandy’s class, discussed in Chapter 9, Section 9.6.1, shows what could be termed an obsessional interest in toy trains . When he is engrossed in this obsession, he presents as being devoid of any emotional connection and it feels as though he doesn’t want, at the moment when they fill his mind, to have any space for emotional connection. When, as an observer in the classroom, I am standing and listening to Angus recount his facts, it feels to some extent as though I could easily drop dead in front of him and he would carry on exactly the same.
In observations of Mandy working with Angus (See Section 9.6.1), she seems (perhaps instinctively) to be able to deal with this “deadness” and to maintain, as far as possible, some kind of live emotional connection to him. My own experience of Angus was much more of uncertainty and perhaps even, in Bion’s terms, dread, at times when engaging with him. It is of course possible that Mandy also went through such feelings in relation to him which I either did not observe or did not pick up on.

One could conjecture about another teacher, perhaps without Mandy's emotional capacity, working with Angus and finding him a significant source of unresolved uncertainty.

As part of the action research cycle, the teacher-researcher might spend a lesson when another teacher is working with Angus as an "observer", perhaps creating an observational record supported by audio recording as in this study. They might also interview other teachers involved with Angus, or Angus himself. This material could then be brought to work study review. The group might then, drawing on one of the key themes in this thesis, reflect on the balance between theoretical/expert and tacit intersubjective ways of coming to know about Angus. They might also reflect, making use of psychoanalytic perspectives on therapeutic approaches to autism. on the baby which becomes the child who perhaps finds communication with others difficult. They might consider that Angus's obsessional interests and the ability to talk to people without really engaging in an encounter where there is any possibility of communicating/knowing the other person, are perhaps a way of avoiding the anxiety aroused by real communication. Perhaps as well they are also a way of avoiding the inevitable sense of "not knowing" and frustration that comes with dealing with unplanned situations and unplanned for ideas. The researcher and colleagues also might conjecture, perhaps drawing implicitly on Alvarez's adaptation of Bion's ideas, that on some level that is not true, the very fact that Angus opens his mouth and talks indicates that on some level there is the desire for communication, even though the apparatus is not there. Thus, through work study review, the teacher might develop a capacity to develop a type of knowledge that goes past seeing Angus as just a confusing problem. Using a modified infant observation approach, they could develop their capacity to productively make use of this uncertainty in coming to (in Bionic terms) know Angus. They might consider that there will be times when Angus can overcome his anxiety, and with careful containment from his teacher, engage in mindful communication.

The hope might then be that, as with a typical action research cycle, by using research methods to examine one problem, the capacity in the future to look at different aspects of the problem, or at other cases altogether is enhanced. In particular, it might be hoped that there would be development of the capacity to

make use of type of reflection on professional activity, both “in the moment” and out of it, which is based on coming to know the other through ‘O’

11.2.4.5 Possibilities and Challenges

Many questions remain as to how this might work in practice.
In particular, how would teachers be supported in developing the necessary theoretical and experiential understanding of the psychoanalytic concepts and modes of thinking underlying such an endeavour, and further be supported in carrying out such a reflective activity in work study settings. It seems impractical to consider this being integrated in to existing courses of initial teacher education, certainly in the UK. Nevertheless, there might be scope for its development within specific post graduate courses at masters level. It is also potentially applicable to the design of future Education Doctorate programmes.
The growing interest in psycho-social studies is beginning to have an influence on social science and social research programmes in higher education. In this context, it is possible to envisage more openness and interest within higher education to the potential for approaches combining infant observation and traditional interpretivist enquiry to thinking about problems and development in professional practice. It is also the case that there is a growing interest in the use of infant observation methods both as a practical tool and for professional development in early years education (Elfer, 2012). In such a potentially beneficial climate, one might be able to envisage a path whereby the psychodynamically informed action research programme outlined here could become a productive reality for groups of post service teachers, although issues of finance, sustainability and interest may still prove insurmountable.

References

ALFIE, 2011. *Memorandum submitted by the Alliance for Inclusive Education in respect of the Education Bill 2011*, London.

Aitken, K.J. and Trevarthen, C., 1997. Self/other organization in human psychological development. *Development and psychopathology*, 9(4), pp.653-77.

Alvarez, A., 1992. *Live Company: Psychotherapy with autistic, borderline, deprived and abused children*, London: Routledge.

American Psychiatric Association (A.P.A), 1994. *Diagnostic and Statistical Manual*, Washington, DC: APA Press.

American Psychiatric Association (A.P.A), 2000. *Diagnostic and Statistical Manual of Mental Disorders (4th ed., text revision) (DSM-IV-TR)*, Washington, DC: American Psychiatric Association.

Arthur-Kelly, M. et al., 2009. Issues in the use of visual supports to promote communication in individuals with autism spectrum disorder. *Disability and rehabilitation*, 31(18), pp.1474-86.

Bagozzi, R.P. and Warshaw, P.R., 1990. Development and test of a theory of technological learning and usage. *Human Relations*, 45(7), pp.660-686.

Bailey, A., Phillips, W. and Rutter, M, 1996. Autism: towards an integration of clinical, genetic, neuropsychological, and neurobiological perspectives. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 37(1), pp.89-126.

Ballet, K., Kelchtermans, Geert and Loughran, J., 2006. Beyond intensification towards a scholarship of practice: analysing changes in teachers' work lives. *Teachers and Teaching: Theory and Practice*, 12(2), pp.209-229.

Baron-Cohen, S., Leslie, A. and Frith, U., 1985. Does the autistic child have a "theory of mind"? *Cognition*, 21(1), pp.37-46.

Barton, L., 1988. *The Politics of special educational needs*, London: Routledge.

Bastiaens, T., and Ebne, M. (2011). Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011. Lisbon: AACE.

Bateson, G., 1979. *Mind and Nature: A Necessary Unity*, London: Bantam Press.

Bick, E., 1964. Notes on Infant Observation in Psycho-Analytic Training. *International Journal of Psycho-Analysis*, 45, pp.558-566.

Bion, W.R., 1962. *Learning from Experience*, London: William Heinemman.

Bion, W.R., 1963. *Elements of Psycho-analysis*, London: William Heinemann.

Bion, W.R., 1965. *Transformations*, London: William Heinemman.

Bion, W.R., 1967. Notes on Memory and Desire. *The Psychoanalytic Forum*, 2(3), pp.272-280.

Bleandonu, G., 1999. *Wilfred Bion: His Life and Works*, New York: Other Press.

Blos, P., 1998. The Second Individuation Process of Adolescence. In M. Perret-Catpovic & F. Ladame, eds. *Adolescence and Psychoanalysis*. London: Karnac.

Bogdashina, O., 2006. *Theory of mind and the triad of perspectives on autism and Asperger syndrome: a view from the bridge*, London: Jessica Kingsley Publishers.

Bollas, C., 1979. The Transformational Object. *International Journal of Psycho-Analysis*, 60, pp.97-107.

Bollas, C., 1992. *Being a Character*, New York: Hill and Wang.

Bollas, C., 1995. *Cracking Up: The Work of Unconscious Experience*, London: Routledge.

Bollas, C., 1999. *The Mystery of Things*, London: Routledge.

Bondy, A.S. and Frost, L.A., 1994. The Picture Exchange Communication System. *Focus on Autism and Other Developmental Disabilities*, 9(3), pp.1-19.

Bowler, D.M., 1992. “Theory of mind” in Asperger’s syndrome. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 33(5), pp.877-893.

Boyle, M.F., 2002. *Schizophrenia: A scientific delusion* 2nd ed., New York: Taylor & Francis.

Boyzatis, R., 1998. *Transforming Qualitative Information: Thematic Analysis and Code Development*, Thousand Oaks, CA: Sage.

Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), pp.77-101.

Broady, T., Chan, A. and Caputi, P., 2010. Comparison of older and younger adults' attitudes towards and abilities with computers: Implications for training and learning. *British Journal of Educational Technology*, 41(3), pp.473-485.

Brown, J. (2006). Reflexivity in the Research Process: Psychoanalytic Observations. *International Journal of Social Research Methodology*, *9*(3), 181-197.

Brown, S. and McIntyre, D., 1993. *Making Sense of Teaching*, London: Open University Press.

Bullen, M., Morgan, T. and Qayyum, A., 2011. No Title. In T. Bastiaens & M. Ebner, eds. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011*. Chesapeake, VA: AACE, pp. 678-687.

Burke-Johnson, R. and Onwuegbuzie, J., 2004. Mixed methods research: a research paradigm whose time has come. *Educational Researcher*, 33(7), pp.14-26.

Burman, E., 2008. *Deconstructing Developmental Psychology*, London: Psychology Press.

Byrne, D., 2011. *Applying Social Science: The role of social research in politics, policy and practice.*, Bristol: Policy Press.

Calderhead, J., 1987. Developing a Framework for the Elicitation and Analysis of Teachers' Verbal Reports[1]. *Oxford Review of Education*, 13(2), pp.183-189.

Caplan, G. (1970). *The Theory and Practice of Mental Health Consultation*. London: Basic Books.

Carlberg, G., 2010. Focused Systematic Case Studies. In J. Tsiantis & J. Trowell, eds. *Assessing Change in Psychoanalytic Psychotherapy of Children and Adolescents*. London: Karnac.

Carr, W., & Kemmis, S. (1986). *Becoming Critical: Education, Knowledge and Action Research*. Lewes: Farmer.

Chatterji, M., 2006. Evidence on “what works”: an argument for extended-term mixed method (ETMM) evaluation designs. *Educational Researcher*, 34(5), pp.14-24.

Christensen, R.W. and Knezek, G.A., 2009. Attitudes Toward Computers Questionnaire. *Perception*, 25(4).

Chua, S.L., Chen, D-T. and Wong, A.F.L., 1999. Computer anxiety and its correlates: a meta-analysis. *Computers in Human Behavior*, 15(5), pp.609-623.

Cilliers, P. and DeVilliers, T., 2000. The Complex I. In W. Wheeler, ed. *The Political Subject*. London: Laurence and Wishart.

Clark, M., 2005. Asking the right questions about teacher preparation. In P.M Denicolo and M. Kompf, eds. *Teacher Thinking and Professional Action*. New York: Routledge.

Clark, M. and Petersen, P.L., 1986. Teacher though processes. In M. C. Wittrock, ed. *Handbook of research in teaching*. New York: Macmillan.

Cobb, P., 1994. Where Is the Mind? Constructivist and Sociocultural Perspectives on Mathematical Development. *Educational Researcher*, 23(7), p.13.

Cohen, L., Manion, L. and Morrison, K., 2007. *Research Methods in Education*, London: Routledge.

Coren, A., 1997. *A Psychodynamic Approach to Education*, London: Sheldon Press.

Cox, M., 2007. The Changing nature of researching IT in education. In *AERA (American Educational Research Conference)*. Chicago: American Educational Research Association.

Crabtree, B. and Miller, W., 1990. A template approach to text analysis: Developing and using codebooks. In B. Crabtree & W. Miller, eds. *Doing qualitative research*. Thousand Oaks, CA: Sage.

Cuban, L., 2001. Why are most teachers infrequent and restrained users of computers in their classrooms? In J. Woodward & L. Cuban, eds. *Technology, Curriculum and Professional Development: Adapting Scholls to Meet the Needs of Students with Disabilities*. Thousand Oaks, CA: Corwin Press.

Dalton, K. M., Nacewicz, B. M., Johnstone, T., Schaefer, H. S., Gernsbacher, M. A., Goldsmith, H. H., Alexander, A. L., et al. (2005). Gaze fixation and the neural circuitry of face processing in autism. *Nature neuroscience*, *8*(4), 519-26.

Davis, F.D., 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), pp.319-340.

Deakin, E.K. and Tiellet Nunes, M.L., 2009. Effectiveness of child psychoanalytic psychotherapy in a clinical outpatient setting. *Journal of Child Psychotherapy*, 35(3), pp.290-301.

Denicolo, P.M. and Kompf, M., 2005. *Teacher Thinking and Professional Action*, New York: Routledge.

Department for Education and Skills, 2004. Every Child Matters: Change for Children Green Paper.

Department of Education, 2010. The Importance of Teaching: Schools White Paper. Available at: http://www.education.gov.uk/schools/toolsandinitiatives/schoolswhitepaper/b0068570/the-importance-of-teaching/ [Accessed March 15, 2012].

Detterman, D.K. and Thompson, L.A., 1997. What is so special about special education? *American Psychologist* , 52(10), pp.1082-1090.

Dexter, S.L., Anderson, R.E. and Becker, H.J., 1999. Teachers'views of computers as catalysts for changes in their teaching practice. *Journal of Research on Computing in Education*, 31(3), pp.221-239.

Dykes, S. (1987). Psychoanalytic Insight in the Classroom: Asset or Liability. *Journal of Educational Therapy*, *1*(4), 43-61.

Elbaz, F., 1983. *Teacher Thinking: a study of practical knowledge*, London: Taylor & Francis.

Elfer, P. (2012). Emotion in nursery work: Work Discussion as a model of critical professional reflection. *Early Years*, *32*(2), 129-141.

Erlandson, P., 2007. *Docile Bodies and Imaginary Minds* Goteborg S., Göteborg, Sweden: Acta Universitatis Gothoburgenis.

Erlandson, P. and Beach, D., 2008. The ambivalence of reflection - rereading Schon. *Reflective Practice*, 9(4), pp.409-421.

Ertmer, P.A. and Ottenbreit-leftwich, A.T., 2010. Teacher Technology Change: How Knowledge, Confidence, Beliefs, and Culture Intersect. *Culture*, 42(3), pp.255-284.

Fereday, J. and Muir-Cochrane, E., 2006. Demonstrating Rigor Using Thematic Analysis□ : A Hybrid Approach of Inductive and Deductive Coding and Theme Development L. M. Smith et al., eds. *International Journal of Qualitative Methods*, 5(1), pp.1-11.

Flyvbjerg, B., 2006. Five Misunderstandings About Case-Study Research C. Seale et al., eds. *Qualitative Inquiry*, 12(2), pp.219-245.

Fogg, B.J., 2003. *Persuasive Techonology. Using Computers to Change what We Think and Do.*, San Francisco, CA: Morgan Kaufman Publishers.

Fogg, B.J. and Eckles, D., 2007. *Mobile Persuasion: 20 Perspectives on the Future of Behavior Change*, Stanford: Stanford Captology Media.

Fonagy, P., 2003. The research agenda: the vital need for empirical research in child psychotherapy. *Journal of Child Psychotherapy*, 29(2), pp.129-136.

Fonagy, P. and Target, M., 2007. The rooting of the mind in the body: New links between attachment theory and pscyhoanalytic thought. *Journal Of The American Psychoanalytic Association*, 55(2), pp.411-456.

Forbes, F., 2007. Towards inclusion: an Australian perspective. *Support for Learning*, 22(2), pp.66-71.

Frith, U., 1989. *Autism. Explaining the Enigma* 1st ed., Oxford: Blackwell.

Frith, U. and Happé, F, 1994. Autism: beyond “theory of mind”. *Cognition*, 50(1-3), pp.115-132.

Frosh, S., 1989. *Psychoanalysis and Psychology: Minding the Gap*, London: Macmillan.

Frosh, S., 1997. *For and Against Psychoanalysis*, London: Routledge.

Frosh, S. and Baraitser, L., 2008. Psychoanalysis and Psychosocial Studies. *Psychoanalysis, Culture & Society*, 13(4), pp.346-365.

Gage, N., 2007. The paradigm wars and their aftermath. In M. Hammersley, ed. *Educational Research and Evidence-based Practice.* London: Sage Publications.

Gardner, D.G., Discenza, R. and Dukes, R.L., 1993. The measurement of computer attitudes: An empirical comparison of available scales. *Journal of Educational Computing Research*, 9(4), pp.487-507.

Geven, A. et al., 2008. Cell phone design for teenage use. In D. Cunliffe, ed. *HCI '08 Proceedings of the Third IASTED International Conference on Human Computer Interaction*. Anaheim, USA: ACTA Press, pp. 236-241.

Gewirtz, S., Shapiro, J., Maguire, M., Mahony, P., & Cribb, A. (2009). Doing teacher research: a qualitative analysis of purposes, processes and experiences. *Educational Action Research*, *17*(4), 567-593.

Grandin, T., 2008. *The Way I see It: A Personal Look at Autism and Aspergers.*, New York, New York, USA: New Horizons.

Gray, C., 2007. *Writing Social Stories with Carol Gray*, London: Future Horizons.

Grotstein, J., 2007. *A Beam of Intense Darkness*, London: Karnac.

Györi, M., 2006. *Autism and Cognitive Archictecture*, Budapest: Akadémiai.

Hammersley, M., 1992. *What's wrong with Ethnography?*, London: Routledge.

Hammersley, Martyn and Atkinson, P., 2007. *Ethnography: Principles in Practice* 3rd ed., London: Routledge.

Hanko, G. (2002). Making Psychodynamic insights accessible to teachers as an integral part of their professional task. *Psychodynamic Practice*, *8*(3), 375-389.

Hanks, W., 1991. Foreword. In J. Lave and E. Wenger, eds. *Situated Learning: Legitimate Peripheral Participation*. Cambridge, UK: Cambridge University Press.

Happé, F., 1993. Communicative competence and theory of mind in autism: a test of relevance theory. *Cognition*, 48(2), pp.101-119.

Happe, F. and Frith, U., 2006. The Weak Coherence Account: Detail-focused Cognitive Style in Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, 36(1), pp.5-25.

Happé, Francesca, Ronald, A. and Plomin, R., 2006. Time to give up on a single explanation for autism. *Nature neuroscience*, 9(10), pp.1218-20.

Hayles, K., 1999. *How we became post-human*, Chicago: University of Chicago Press.

Hegarty, S., 1998. Challenges to Inclusive Education: A European Perspective. In S. J. Vitello and D. E. Mithaug, eds. *Inclusive Schooling: National and International, Perspectives*. London: Routledge.

Hennessy, Sara, Deaney, R. and Ruthven, K., 2003. *Pedagogic Strategies for Using ICT to Support Subject Teaching and Learning: An Analysis Across 15 Case Studies. Research Report No. 03/1*, Cambridge: Faculty of Education.

Hennessy, S, Ruthven, K. and Brindley, S., 2005. Teacher Perspectives on Integrating ICT into Subject Teaching: Commitment, Constraints, Caution, and Change. *Journal of Curriculum Studies*, 37(2), pp.155-192.

Henriques, J., Holloway, W., Urwin, C., Venn, C. and Walkerdine, V. 1988. *Changing the subject: psychology, social regulation, and subjectivity* 1st ed., London: Routledge.

Hinshelwood, R.D. and Skogstad, W., 2000. The method of observing organisations. In R. D. Hinshelwood & Wilhelm Skogstad, eds. *Observing organisations: anxiety, defence and culture in health care*. London: Routledge, p. 175.

Hinshelwood, R.D. and Skogstad, W., 2002. Irradiated by Distress: Observing Psychic Pain in Health Care Organizations. *Psychoanalytic Psychotherapy*, 16(2), pp.110-124.

Hobson, R.P., 1993. *Autism and the Development of Mind*, Psychology Press.

Hobson, R. P. (2011). On the relations between autism and psychoanalytic thought and practice. *Psychoanalytic Psychotherapy*, *25*(3), 229-244.

Hodkinson, A., 2009. Pre-service teacher training and special educational needs in England 1970–2008: is government learning the lessons of the past or is it experiencing a groundhog day? *European Journal of Special Needs Education*, 24(3), pp.277-289.

Hoggett, P., 2008. What's in a Hyphen? Reconstructing Psychosocial Studies. *Psychoanalysis, Culture & Society*, 13(4), pp.379-384.

Holden, H. and Rada, R., 2011. Understanding the Influence of Perceived Usability and Technology Self-Efficacy on Teachers' Technology Acceptance. *Journal of Research on Technology in Education*, 43(4), pp.343-367.

Hollway, W., 1988. Fitting Work: psychological assessment in institutions. In J. Henriques et al., eds. *Changing the subject: psychology, social regulation, and subjectivity*. London: Routledge.

Howlin, P., 2005. Outcome in Autism Spectrum Disorders. In *Handbook of Autism and Pervasive Developmental Disorders*. Hoboken, NJ US: Wiley, pp. 201-220.

Jackson, E. (2005). Developing observational skills in school settings: the impact of work discussion groups for staff. *Infant Observation*, *8*(1), 5-17.

Jefferson, T., 2008. What is "The Psychosocial"? A Response to Frosh and Baraitser. *Psychoanalysis, Culture & Society*, 13(4), pp.366-373.

Jones, P., 2005. Inclusion: lessons from the children. *British Journal of Special Education*, 32(2), pp.60-66.

Jopling, D., 1993. Cognitive Science, other minds and the philosophy of dialogue. In U. Neisser, ed. *The perceived self: ecological and interpersonal sources of self knowledge*. Cambridge: Cambridge University Press, pp. 290-311.

Jordan, R., 2005. Managing autism and Asperger's syndrome in current educational provision. *Pediatric rehabilitation*, 8(2), pp.104-112.

Jordan, R., 2008. Autistic spectrum disorders: a challenge and a model for inclusion in education. *British Journal of Special Education*, 35(1), pp.11-15.

Jordan, R. and Powell, S., 1995. *Understanding and Teaching Children with Autism*, London: Wiley-Blackwell.

Kaland, N., Smith, L. and Mortensen, E.L., 2008. Brief report: cognitive flexibility and focused attention in children and adolescents with Asperger syndrome or high-functioning autism as measured on the computerized version of the Wisconsin Card Sorting Test. *Journal of Autism and Developmental Disorders*, 38(6), pp.1161-1165.

Kelchtermans, G, 1993. Getting the story, understanding the lives: From career stories to teachers' professional development. *Teaching and Teacher Education*, 9(5-6), pp.443-456.

Klein, M., 1998. The development of a child. In *Love, Guilt and Reparation*. London: Vintage.

Knight, B.A., 1999. Towards Inclusion of Students with Special Educational Needs in the Regular Classroom. *Support for Learning*, 14(1), pp.3-7.

Lather, P., 2007. *Getting Lost: Feminist Efforts toward a Double(d) Science*, Albany, NY US: SUNY Press.

Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*, Cambridge UK: Cambridge University Press

Leblanc, L., Richardson, W. and Burns, K. a., 2009. Autism Spectrum Disorder and the Inclusive Classroom: Effective Training to Enhance Knowledge of ASD and Evidence-Based Practices. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, 32(2), pp.166-179.

Leontiev, A.N. and Leontiev, A.A., 1959. Leontiev - Social and Individual in Language. *Language and Speech*, 2(3), pp.193-205.

Lewis, A. and Norwich, B., 2005. *Special teaching for special children?*, Milton Keynes: Open University Press.

Lincoln, Y.S. and Guba, E.G., 1985. *Naturalistic inquiry*, Thousand Oaks, CA: Sage Publications.

Lord, C., Rutter, Michael and LeCoutier, A., 1994. Autism Diagnostic Interview-Revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 24(5), pp.659-685.

Lord, C., Risi, S., Lambrecht, L, Cook, E.H., Leventhal, B.H., DiLavore, P.C., Pickles, A. and Rutter, M., 2000. The autism diagnostic observation schedule-generic: a standard measure of social and communication deficits associated with the spectrum of autism. *Journal of Autism and Developmental Disorders*, 30(3), pp.205-223.

Magee, B., 1998. *Confessions of a Philosopher: A Journey Through Western Philosophy*, London: Phoenix.

Magee, B., 2000. The great philosophers: an introduction to Western philosophy. *hmcorgqa*, p.352.

Mann, G., 2000. Transformational, Conservative and terminal objects: the application of Bollas's concepts to practice. *British Journal of Psychotherapy*, 17(1), pp.3-16.

Mann, G., 2002. Transformational, Conservative and Terminal Objects: The Application of Bollas's Concepts to Practice. In J. Scala, ed. *The Vitality of Objects: Exploring the Work of Christopher Bollas*. London: Continuum.

Meschtscherjakov, A., 2009. Mobile attachment – Emotional attachment towards mobile devices and services. In *The Proceedings of the 11th International Conference on Human-Computer Interaction with Mobile Devices and Services, Mobile HCI'09*. Bonn, Germany.

Mesibov, G.B. and Shea, V., 2005. Adolescents and adults with Autism. In F. Volkmar et al., eds. *Handbook of Autism and Pervasive Developmental Disorders*. Hoboken, NJ US: Wiley.

Mesibov, G.B. and Shea, V., 2010. The TEACCH program in the era of evidence-based practice. *Journal of autism and developmental disorders*, 40(5), pp.570-9.

Miles, B. and Huberman, N., 1994. *Qualitative Data Analysis: An Expanded Sourcebook* 2nd ed., Thousand Oaks, CA: Sage.

Miller, L., Rustin, M and Shuttleworth, J., 1997. *Closely observed infants*, London: Gerald Duckworth.

Mishler, E.G., 1991. Representing discourse: The rhetoric of transcription N. Fielding, ed. *Journal Of Narrative And Life History*, 1(4), pp.255-280.

Molloy, H. and Vasil, L., 2002. The Social Construction of Asperger Syndrome: The pathologising of difference? *Disability & Society*, 17(6), pp.659-669.

Mottron, L., 2011. Changing perceptions: The power of autism. *Nature*, 479(7371), pp.33-35.

Mukuria, G.M. and Obiakor, F.E., 2008. Curriculum innovation to educate students with autism in general education. In A. F. Rotatori, F E Obiakor, & S. Burkhardt, eds. *Autism and Developmental Disabilities: Current Practices and Issues*. Bingley, UK: JAI Press, pp. 25-40.

Nass, C., Steuer, J. and Tauber, E.R., 1994. Computers are social actors. In *Conference companion on Human factors in computing systems - Computer Human Interaction '94*. New York: ACM Press, pp. 72-28.

National Autistic Society, Approaches to Autism. Available at: http://www.autism.org.uk/approaches [Accessed March 10, 2012].

Neisser, U., 1993. The self perceived. In Ulric Neisser, ed. *The perceived self: ecological and interpersonal sources of self knowledge*. Cambridge: Cambridge Univ Press, pp. 3-12.

Nias, J., 1989. *Primary Teachers Talking*, London: Routledge.

Noddings, N., 2006. *Critical lessons: what our schools should teach*, Cambridge, UK: Cambridge University Press.

Oliver, M., 1990. *The Politics of Disablement*, London: Macmillan.

Oliver, M., 2011. Technological determinism in educational technology research: some alternative ways of thinking about the relationship between learning and technology. *Journal of Computer Assisted Learning*, (November 2010), pp.373-384.

Orlikowski, W.J. and Baroudi, J. j., 1991. Studying information technology in organizations: research approaches and assumptions. *Information Systems Research*, 2(1), pp.1-28.

O'Shaughnessy, E., 1994. What is a Clinical Fact?. *International Journal of Psycho-Analysis*, 75, pp.939-947.

Owen, E., 2011. UK youth lead Europe in mobile web use. *Marketing Week*.

Ozonoff, S., Pennington, B.F. and Rogers, S.J., 1991. Executive Function Deficits in High-Functioning Autistic Individuals: Relationship to Theory of Mind. *Journal of Child Psychology and Psychiatry*, 32(7), pp.1081-1105.

Parsons, S., Lewis, Ann and Ellins, J., 2009. The views and experiences of parents of children with autistic spectrum disorder about educational provision: comparisons with parents of children with other disabilities from an online survey. *European Journal of Special Needs Education*, 24(1), pp.37-58.

Peterson, P.L., Marx, R.W. and Clark, C.M., 1978. Teacher Planning, Teacher Behavior, and Student Achievement. *American Educational Research Journal*, 15(3), pp.417-432.

Prensky, M., 2001a. Digital Natives , Digital Immigrants. *On the Horizon*, 9(5), pp.1-6.

Prensky, M., 2001b. Digital Natives, Digital Immigrants, Part 2: Do they really think differently? *On the Horizon*, 9(6), pp.1-6.

Price, H., 2004. *The Emotional Context of Young Children's Literacy Learning*. University of East London.

Price, H., 2006. Jumping on shadows: catching the unconscious in the classroom. *Journal of Social Work Practice*, 20(2), pp.145-161.

Ranieri, M., Calvani, A. and Fini, A., 2011. Digital Competence In K-12. Theoretical Models, Assessment Tools and Empirical Research. In T. Bastiaens and M. Ebner, eds. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011*. Chesapeake, VA: AACE, pp. 539-548.

Reay, D. and Lucey, H., 2010. Identities in transition: anxiety and excitement in the move to secondary school. *Oxford Review of Education*, 26(2), pp.191-205.

Rogoff, B., 1990. *Apprenticeship in thinking: Cognitive development in social context*, New York: Oxford University Press.

Russell, G. and Bradley, G., 1997. *Teachers' computer anxiety: implications for professional development*, Springer Netherlands.

Rust, J. and Smith, A., 2006. How should the effectiveness of Social Stories to modify the behaviour of children on the autistic spectrum be tested? *Autism*, 10(2), p.125=138.

Rustin, Michael, 2006. Infant observation research: What have we learned so far? *Infant Observation*, 9(1), pp.35-52.

Rustin, Michael, 2008. For Dialogue Between Psychoanalysis and Constructionism: A Comment on Paper by Frosh and Baraitser. *Psychoanalysis, Culture & Society*, 13(4), pp.406-415.

Rustin, M. E. (1989). Encountering primitive anxieties. In L. Miller, M. E. Rustein, M. J. Rustin, & J. Shuttleworth (Eds.), *Closely Observed Infants*. London: Duckworth.

Rutter, M., 2005. Genetic influences and autism. In Fred R. Volkmar et al., eds. *Handbook of Autism and Pervasive Developmental Disorders*. Hoboken, NJ US: Wiley, pp. 425-452.

Rutter, M., 2011. Progress in Understanding Autism□ : 2007– 2010. *Journal of Autism and Developmental Disorders*, (October 2010), pp.395-404.

Ryan, M., 1989. *Politics and Culture: Working Hypotheses for a Post-Revolutionary Society*, London: Macmillan.

Saltzmann, C. (2006). Introducing educators to a psychodynamically informed teaching practice. *Psychodynamic Practice*, *21*(1), 67-86.

Salzberger-Wittenberg, I., Williams, G. and Osborne, E., 1999. *The Emotional Experience of Learning and Teaching* 2nd ed., London: Karnac.

Sandholtz, J., Ringstaff, C. and Dwyer, D., 1997. *Teaching with technology: Creating student-centered classrooms*, New York, New York, USA: Teachers College Press.

Scheurich, J.J., 1997. *Research Method in the Postmodern*, London: RoutledgeFalmer.

Schön, D.A., 1983. *The Reflective Practitioner: How Professionals Think in Action*, Basic Books.

Shacklock, G., 1998. Professionalism and Intensification in Teaching: a case study of “care” in teachers’ work. *AsiaPacific Journal of Teacher Education*, 26(3), pp.177-189.

Shulman, L.S., 1987. Knowledge and teaching: Foundations of a new reform. *Harvard Educational Review*, 57(1), pp.1-22.

Shuttleworth, A., 1997. Turning Towards the Cognitive. *Journal of Melanie Klein and Object Relations*, 15(4), pp.647-663.

Shuttleworth, J., 2010. Faith and culture: community life and the creation of a shared psychic reality. *Infant Observation*, 13(1), pp.45-58.

Smart, B.,1985. *Michel Foucault* London: Routledge.

Somekh, B.,Underwood, J., Convery, A., Dillon, G., Jarvis, J., Lewin, C., Mavers, D., Saxon, D., Sing, S., Steadman, S., Twining, P. and Woodrow, D., 2007. *Evaluation of the ICT Test Bed project. FINAL REPORT*, London: Becta.

Steinsaltz, A., 2003. *Opening the Tanya: discovering the moral and mystical teachings of a classic work of Kabbalah, Volume 1*, New York: Jossey-Bass.

Stern, M. (2004). The lure of a mad world: supporting a 10 year old boy's capacity for ordinary contact. In M. Rhode & T. Klauber (Eds.), *The Many Faces of Asperger's Syndrome* (pp. 199-215). London: Karnac.

Strauss, A. and Corbin, J., 1998. *Basics of Qualitative Research* 2nd ed., Thousand Oaks, CA: Sage Publications.

Strong-Wilson, T., 2008. Changing literacies, changing formations: the role of elicitation in teacher action research with new technologies. *Teachers and Teaching*, 14(5), pp.447-463.

Symington, J. and Symington, N., 1996. *The clinical thinking of Wilfred Bion*, London: Routledge.

Teo, T. and Noyes, J., 2011. An assessment of the influence of perceived enjoyment and attitude on the intention to use technology among pre-service teachers: A structural equation modeling approach. *Computers & Education*, 57(2), pp.1645-1653.

Trepagnier, C., Sebrechts, M. M., & Peterson, R. (2002). Atypical Face Gaze in Autism. *CyberPsychology & Behavior*, *5*(3), 213-217.

Trevarthen, C. and Aitken, K.J., 2001. Infant intersubjectivity: research, theory, and clinical applications. *Journal of child psychology and psychiatry, and allied disciplines*, 42(1), pp.3-48.

Truckle, B. (2004). On becoming of consequence. In M. Rhode & T. Klauber (Eds.), *The Many Faces of Asperger's Syndrome* (pp. 234-248). London: Karnac.

University of North Carolina, Division TEACCH. Available at: http://www.teacch.com/ [Accessed March 10, 2012].

Volkmar, F. R., Paul, R., Klin, A., & Cohen, D. 2005. *Handbook of Autism and Pervasive Developmental Disorders, Two Volume Set*, New York, New York, USA: Wiley.

Waddell, M., 1998. *Inside Lives: Psychoanalysis and the Growth of the Personality*, London: Karnac.

Walkerdine, Valerie, Lucey, H. and Melody, J., 2001. *Growing up girl: Psychosocial Explorations of Gender and Class*, Palgrave.

Wehmeyer, K., 2007. Assessing users' attachment to their mobile devices. In *The Proceedings of the 6th International Conference on Mobile Business, ICMB'07.* Toronto, Canada: IEEE Computer Society.

White, S.J., Burgess, P.W. and Hill, E.L., 2009. Impairments on "open-ended" executive function tests in autism. *Autism research official journal of the International Society for Autism Research*, 2(3), pp.138-147.

Whitty, M., and Carr, A., 2006. New rules in the workplace: Applying object-relations theory to explain problem Internet and email behaviour in the workplace. *Computers in Human Behavior*, 22(2), pp. 235-250.

Wing, L and Gould, J., 1979. Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders*, 9(1), pp.11-29.

Wing, Lorna, 2005. Reflections on Opening Pandora's Box. *Journal of Autism and Developmental Disorders*, 35(2), pp.197-203.

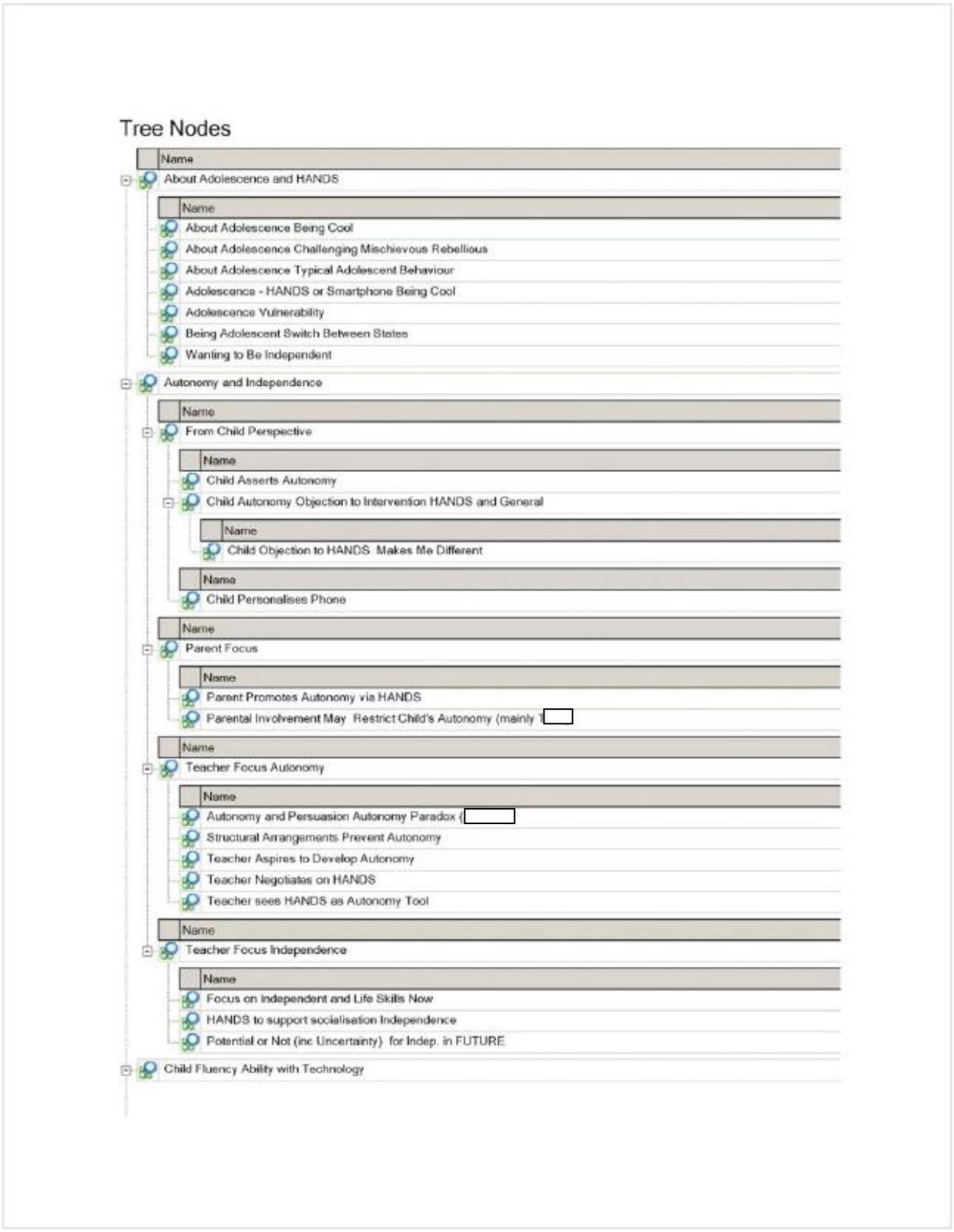
Woods, P., 1996. *Researching the art of teaching, ethnography for educational use*, London: Routledge.

Wozney, L., Venkatesh, V. and Abrami, P.C., 2006. Implementing Computer Technologies: Teachers' Perceptions and Practices. *Technology*, 14, pp.173-207.

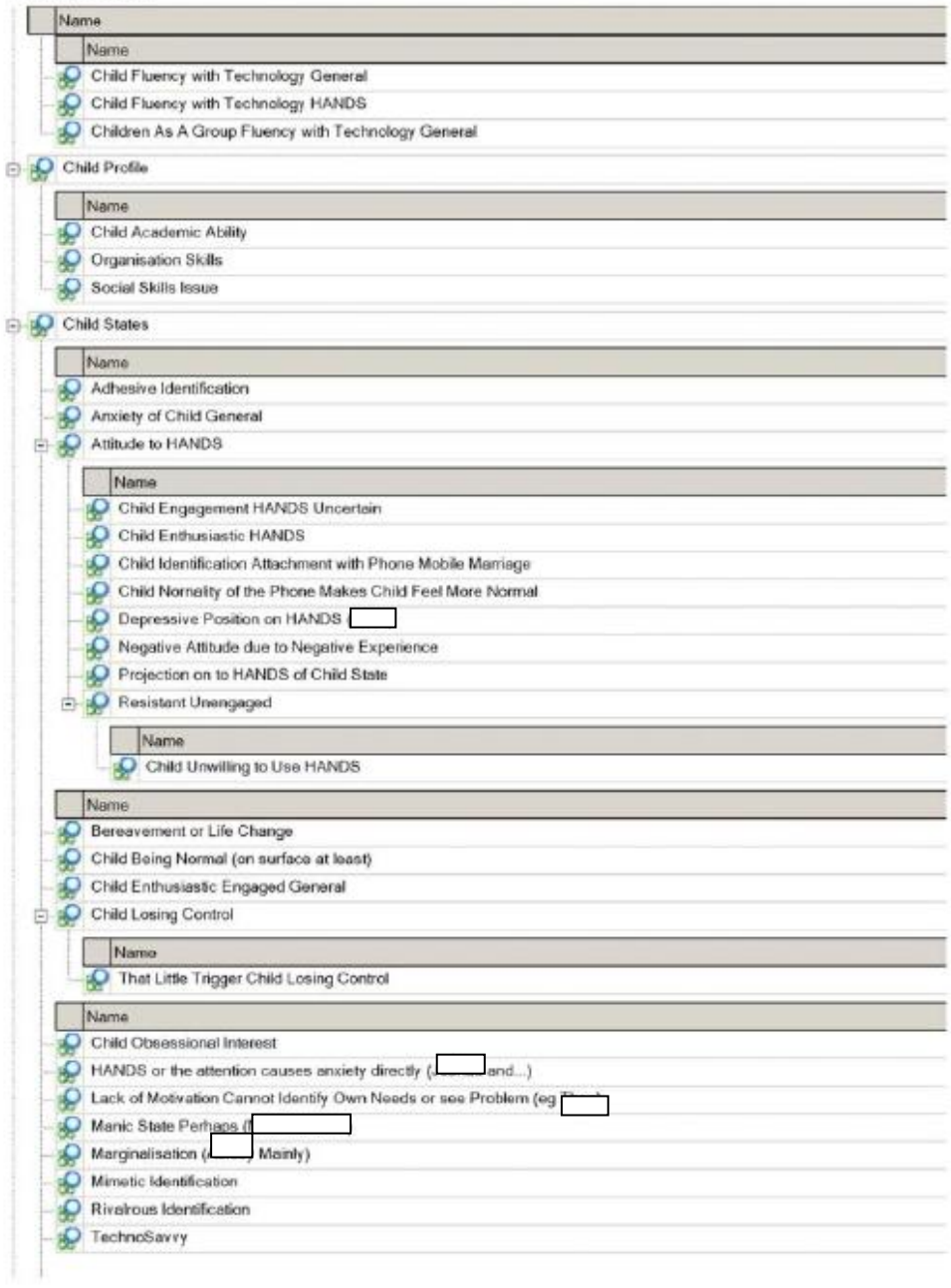
Yin, K., 1981. The Case Study Crisis: Some Answers. *Administrative Science Quarterly*, 26, pp.58-65.

YouGov, 2006. Mobile Life Youth Report 2006. Available at: http://www.yougov.co.uk/extranets/ygarchives/content/pdf/CPW060101004_2.pdf [Accessed March 15, 2011].

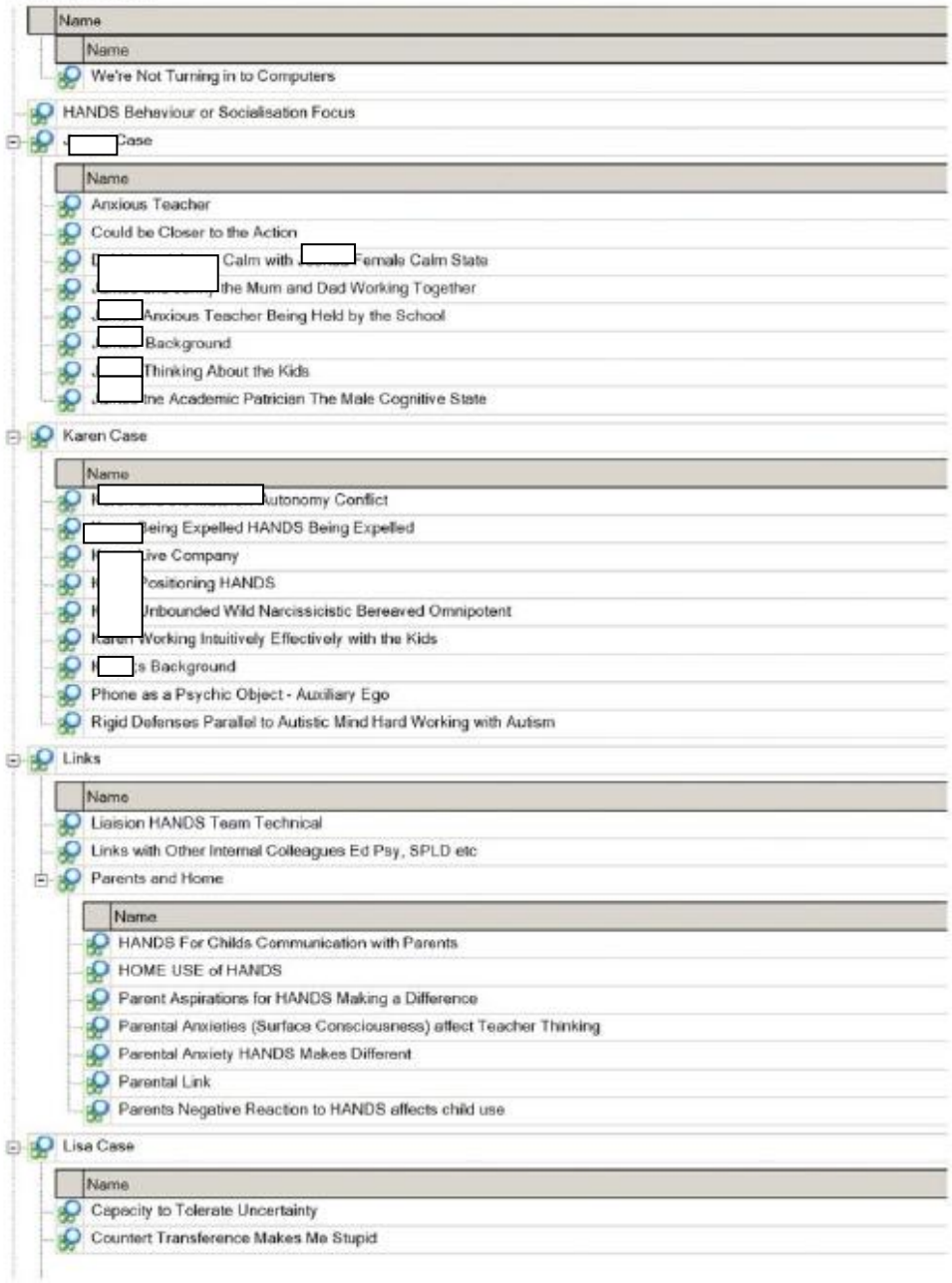
Appendix 1 Data Nodes in Nvivo



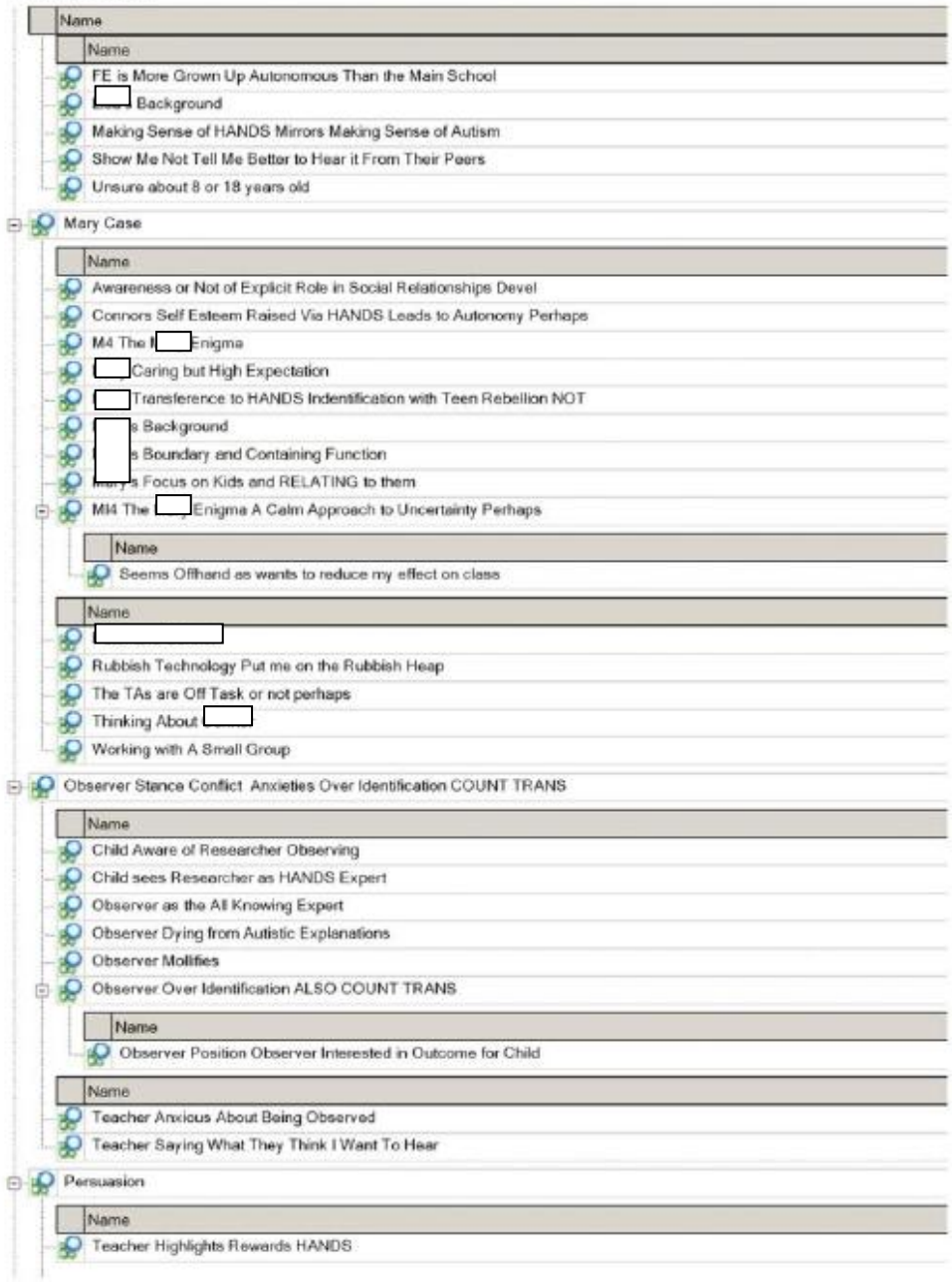
Tree Nodes


Name
Name
Child Fluency with Technology General
Child Fluency with Technology HANDS
Children As A Group Fluency with Technology General
Child Profile
Name
Child Academic Ability
Organisation Skills
Social Skills Issue
Child States
Name
Adhesive Identification
Anxiety of Child General
Attitude to HANDS
Name
Child Engagement HANDS Uncertain
Child Enthusiastic HANDS
Child Identification Attachment with Phone Mobile Marriage
Child Normality of the Phone Makes Child Feel More Normal
Depressive Position on HANDS
Negative Attitude due to Negative Experience
Projection on to HANDS of Child State
Resistant Unengaged
Name
Child Unwilling to Use HANDS
Name
Bereavement or Life Change
Child Being Normal (on surface at least)
Child Enthusiastic Engaged General
Child Losing Control
Name
That Little Trigger Child Losing Control
Name
Child Obsessional Interest
Lack of Motivation Cannot Identify Own Needs or see Problem
Mimetic Identification
Rivalrous Identification
TechnoSavvy

Tree Nodes


Name
Name
We're Not Turning in to Computers
HANDS Behaviour or Socialisation Focus
[redacted] Case
Name
Anxious Teacher
Could be Closer to the Action
[redacted] Calm with [redacted] Female Calm State
[redacted] the Mum and Dad Working Together
[redacted] Anxious Teacher Being Held by the School
[redacted] Background
[redacted] Thinking About the Kids
[redacted] ne Academic Patrician The Male Cognitive State
Karen Case
Name
[redacted] utonomy Conflict
[redacted] eing Expelled HANDS Being Expelled
[redacted] ive Company
[redacted] ositioning HANDS
[redacted] nbounded Wild Narcissicistic Bereeved Omnipotent
[redacted] Working Intuitively Effectively with the Kids
[redacted] s Background
Phone as a Psychic Object - Auxiliary Ego
Rigid Defenses Parallel to Autistic Mind Hard Working with Autism
Links
Name
Liaision HANDS Team Technical
Links with Other Internal Colleagues Ed Psy, SPLD etc
Parents and Home
Name
HANDS For Childs Communication with Parents
HOME USE of HANDS
Parent Aspirations for HANDS Making a Difference
Parental Anxieties (Surface Consciousness) affect Teacher Thinking
Parental Anxiety HANDS Makes Different
Parental Link
Parents Negative Reaction to HANDS affects child use
Lisa Case
Name
Capacity to Tolerate Uncertainty
Countert Transference Makes Me Stupid

Tree Nodes


Name
Name
FE is More Grown Up Autonomous Than the Main School
[redacted] Background
Making Sense of HANDS Mirrors Making Sense of Autism
Show Me Not Tell Me Better to Hear it From Their Peers
Unsure about 8 or 18 years old
Mary Case
Name
Awareness or Not of Explicit Role in Social Relationships Devel
Connors Self Esteem Raised Via HANDS Leads to Autonomy Perhaps
M4 The I[redacted] Enigma
[redacted] Caring but High Expectation
[redacted] Transference to HANDS Indentification with Teen Rebellion NOT
[redacted] Background
[redacted] Boundary and Containing Function
[redacted] Focus on Kids and RELATING to them
M4 The [redacted] Enigma A Calm Approach to Uncertainty Perhaps
Name
Seems Offhand as wants to reduce my effect on class
Name
[redacted]
Rubbish Technology Put me on the Rubbish Heap
The TAs are Off Task or not perhaps
Thinking About [redacted]
Working with A Small Group
Observer Stance Conflict Anxieties Over Identification COUNT TRANS
Name
Child Aware of Researcher Observing
Child sees Researcher as HANDS Expert
Observer as the All Knowing Expert
Observer Dying from Autistic Explanations
Observer Mollifies
Observer Over Identification ALSO COUNT TRANS
Name
Observer Position Observer Interested in Outcome for Child
Name
Teacher Anxious About Being Observed
Teacher Saying What They Think I Want To Hear
Persuasion
Name
Teacher Highlights Rewards HANDS

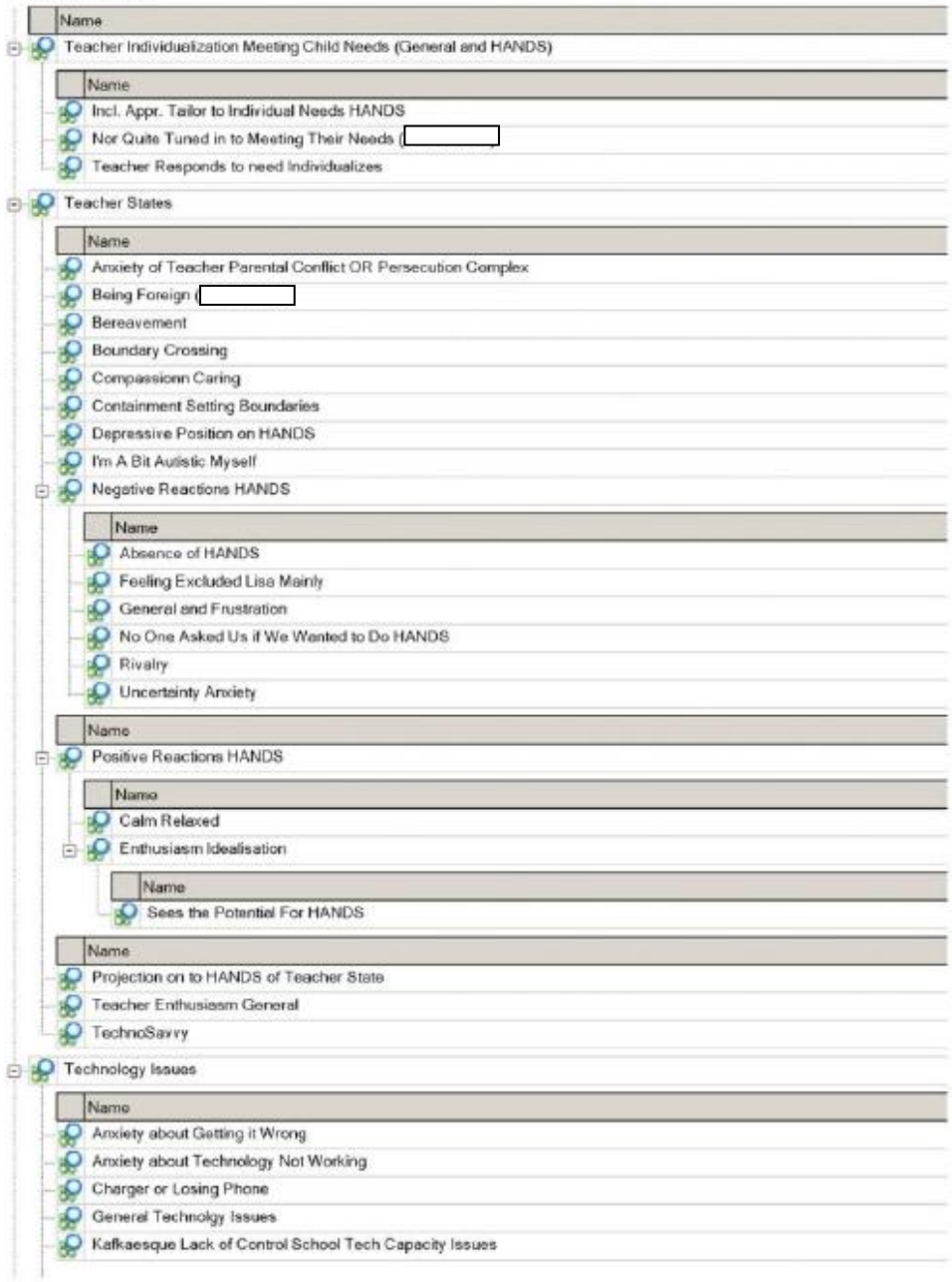
Tree Nodes

- Name
  - Name
    - Teacher Incentives (HANDS Other Functions)
    - Teacher Incentivises
    - Teacher Invites HANDS
    - Teacher Reinforcing
    - Use of Reward Points
  - Pilar Case
    - Name
      - Better Not to Try Defence Against Anxiety or NOT
      - Oliver Prefers to Get Instructions from HANDS
      - Pilar's Background
      - Pilar's Teaching Style
      - Positioning of HANDS
      - Techno Problem Savviness (Lack of)
  - School Conceptualization Attitude to Working with Autism
    - Name
      - Academic vs Social Skills Curriculum
      - Conflict School to Teacher View re Autonomy
      - Conflict School to Teacher View Working with Autism
      - S[redacted] Approach
  - States of Mind Varying or Uncertainty
  - Teacher Conceptualization of Attitude to and Ways of Working With Autism
    - Name
      - Autism is Lack of Transfer of Skills
      - Children ASD Cant See Beyond Today Show Rather Than Tell
      - Children with ASD are just Normal
      - Children with Aurism are Stuck in Their Ways or Rigid Thinking
      - Children with Autism are more Creative [redacted]
      - Children with Autism Dont Recognise or Agree to Social Rules
      - Children with Autism Sequencing Executive Problems
      - Conceptuleization of Autism by Teacher is Fuzzy
      - Dont Recognise Other Points of View
      - Empathise With Them Put Yourself in Their Shoes [redacted]
      - Every Child with Aut. is Diff.Need to Fit the TECH
      - Every Child with Autism is Different
      - HANDS Need to Be Motivated Themselves to Do Something
      - Labelling (Diagnosis) is part of the problem (2ndry effects labelling)
      - Lack of A Sense of Time
      - Low Arousal for Children with Autism
      - Meeting in the Middle (Society and the Individual) re Autonomy
      - Practical Work Is Better
      - Reach and out draw them in academically setting the expectation

Tree Nodes

- Name
  - Name
    - Reach Out and Draw Them in to Relating
    - Relate to Them and Implicit Thinking (Mary but more_
    - Repetition Can Achieve Behaviour Change
    - Restricted Capacity in Autism affects potential for autonomy
    - Speak to Them Like Normal Kids
    - Structure is Key for Children with Autism
    - Teacher Recognises Changing Not Static Child [and environment]
    - Teacher Thinking and Strategy Selection
      - Name
        - Attit. to Working Flex. and Patient. TRYING It Out
        - Attitude to Working It's Persuasion
        - Attitude to Working Its Talking to Them
        - Attitude to Working Sort of Ideas Built Up
        - Do What I am Told By the School ([redacted])
        - Draw on Assessment Data [redacted]
        - Draw on What Worked Before or Not Experience with Sim. Kids
        - Drawing on Knowledge from the Web
        - Drawing on Other Teacher Experience inc TAs working with them
        - Drawing on Training Courses and Reading
        - Expert Knowledge Wanting to Know More or Uncertainty
        - Getting to Know Them Initially is Key
        - HANDS PROMPTS Thinking About Strategy Selection or Uncertainty OR it DOESNT
        - Positioning of Expert Internal Collegue Knowledge
        - Positioning of Theoretical Knowledge vs Teacher Implict Working Knowledge
        - Uncertainty About Diagnosis
        - Uncertainty about whether a Behaviour is Autism or Not
        - Uncertainty Thinking about Strategy Selection General
        - Uncertainty Thinking About Strategy Selection HANDS
      - Name
        - They have problems but its great when you help them overcome it
        - They Need Time to Process Percolation [redacted]
        - They Seem to Understand But They Really Dont ([redacted]
        - Visual Support and Non Verbal is Important for Children with Autism
    - Teacher Direction Not Autonomy
      - Name
        - Teacher Insistent
        - Teacher Instruction Persuasion HANDS
    - Teacher Fluency Ability with Technology
      - Name
        - Teacher Perception Ability General Technology
        - Teacher Perception Ability HANDS

Tree Nodes


Name
Teacher Individualization Meeting Child Needs (General and HANDS)
Name
Incl. Appr. Tailor to Individual Needs HANDS
Nor Quite Tuned in to Meeting Their Needs (
Teacher Responds to need Individualizes
Teacher States
Name
Anxiety of Teacher Parental Conflict OR Persecution Complex
Being Foreign (
Bereavement
Boundary Crossing
Compassionn Caring
Containment Setting Boundaries
Depressive Position on HANDS
I'm A Bit Autistic Myself
Negative Reactions HANDS
Name
Absence of HANDS
Feeling Excluded Lisa Mainly
General and Frustration
No One Asked Us if We Wanted to Do HANDS
Rivalry
Uncerteinty Anxiety
Name
Positive Reactions HANDS
Name
Calm Relaxed
Enthusiasm Idealisation
Name
Sees the Potential For HANDS
Name
Projection on to HANDS of Teacher State
Teacher Enthusiasm General
TechnoSavvy
Technology Issues
Name
Anxiety about Getting it Wrong
Anxiety about Technology Not Working
Charger or Losing Phone
General Technolgy Issues
Kafkaesque Lack of Control School Tech Capacity Issues

Tree Nodes

Name
Name
Not being able to make phone calls or send texts
Preparation HANDS Takes a Lot of Time and Effort
School Technical Capacity Issues General
Teacher Effort to get it working
Teacher Views on Improvements to HANDS
Technology Issue directly affects use
Technology Issue Doesn't Quite Fit Needs
Technology Not There When You Need It
The Thorny Internet Question
Using Other Phones as HANDS no SIM
Would Like More Training Support
You Shouldnt Promise Our Kids and Not Deliver
Uses of HANDS
Name
Description of an Intervention
Evaluation of Appropriateness Effectiveness of HANDS
Frequency of Use of HANDS
Other Phone Functions

Appendix 2 Bion's Grid

		Definatory Hypotheses	Psi	Notation	Attention	Inquiry	Action	...n,
A	Beta elements	A1	A2				A6	
B	Alpha elements	B1	B2	B3	B4	B5	B6	...Bn
C	Dream Thoughts	C1	C2	C3	C4	C5	C6	...Cn
D	Pre conception	D1	D2	D3	D4	D5	D6	...Dn
E	Conception	E1	E2	E3	E4	E5	E6	...En
F	Concept	F1	F2	F3	F4	F5	F6	...Fn
G	Scientific Deductive System		G2					
H	Algebraic Calculus							